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I. AN EXPEDITION TO MOUNT MENUANG GASING, SELANGOR.

By HENRY N. RIDLEY, F.R.S., F.L.S.; *with an account of
the Journey by C. B. KLOSS.**

[Read 7th November, 1912.]

[MOUNT MENUANG GASING is 'Bukit Nyor' or 'Nuang' of local maps, one of the peaks of the range which forms the backbone of the Federated Malay States, and is situated within a mile of the spot where the boundaries of the States of Selangor, Perak, and the Negri Sembilan meet. It is 4,908 feet in height, and though separated on the north from the more massive portions of the main range by passes of 2,000 feet or so, it yet possesses a true mountain fauna:† south of it the range becomes gradually broken up into more or less isolated groups of hills, few of which attain an equal altitude; while only to those in the immediate neighbourhood is the high-level fauna known to extend.

The summit of Měnuang Gasing itself is a somewhat steep peak rising above hills of only slightly inferior altitude.

The collection, of which Mr. Ridley treats below, was made in the course of a four or five days' visit in February, 1912. At 6 o'clock one morning I left Dusun Tua (in the Ulu Langat district of Selangor, 17 miles from Kuala Lumpur), which is a rest-house near some hot springs impregnated with sulphuretted hydrogen, and at 5.45 P.M. made camp on a hill-side 2,950 feet high. The day's march had been an extremely hard one (owing to the many descents we had to make before finally attaining this altitude), and we all arrived thoroughly exhausted, but I felt little compunction in getting the utmost out of the Sakais who acted as carriers, since they had refused to remain with me for more than one night, and had stood out for most extortionate remuneration.

Our palm-leaf shelter was made on the mountain-side on a flat knoll which the Sakais called Bukit Pengaseh, and even at that moderate altitude we found the nights extremely cold owing to the presence of a strong wind which blew uninterruptedly across the ridge; at midday the thermometer generally indicated about 70°.

* Reprinted from the Journal of the Linnean Society—Botany, Vol. XLI. July, 1913.

† An account of the mammals and birds obtained on a previous visit to these mountains appears in an earlier number of this Journal (Vol. iv. pp 235-241 (1911)).

Save for the occurrence of "Job's Tears" (*Coix Lachryma Jobi*) at 1350 feet, and the commencement of the Giant Bamboo zone at 2000 feet, I noted little of botanical interest, as, after leaving the various streams which form the sources of the Langat River, attention was principally directed to a search for water. I remember, however, a most unexpected show of Cannas in a Saki clearing at 1,000 feet.

The collection was made between the camp and the top of Měnuang Gasing, about $3\frac{1}{2}$ hours distant to the N. W. along a very undulating track, which ran up and down hill-sides, along ridges, and over many minor summits, but nowhere reached as low a level as Bukit Pengaseh.

In two spots some distance apart, but both at an altitude of 4,100 feet, a yellow Balsam (*Impatiens oncidoides*) occurred, thickly covering swampy patches on the ridges, while I have rarely seen denser draperies of moss at a height of 4,300 feet than on a rocky hill-top covered with trees whose roots crawled over the surface; here orchids were numerous. At this height also we discovered a swamp and small pond on a level ridge which was deep in mud all along its length. Much of this mud was covered by a small-leaved creeping plant (*Pratia begoniaefolia*) which bore immense numbers of round pinkish-red fruits.

The ridges struck me as being unusually swampy, but the summit of Měnuang Gasing itself was quite dry, being of conical form; it had been cleared some years previously, and was covered principally with myrtles, pitcher-plants, and long grasses.

It will be seen that the plants obtained occurred at altitudes between 3,000 feet and 4,908 feet.—C. B. K.]

The Flora.

The collection of plants made by Mr. Kloss on this expedition and described below, shows clearly the fact that this mountain, possessing as he states a high-level fauna, bears also a high-level flora.

The mountain itself possesses an interest in that it is one of the most southern ones of anything like that altitude in the peninsula, and the flora we find thereon is shown by this collection to be similar to that of the central mountain chain running to the northern part of the peninsula. This is illustrated by the occurrence here of such plants as the beautiful Golden Balsam *Impatiens oncidoides*, *Bucklandia populnea*, the rare *Polyosoma parviflora*, *Pratia begoniaefolia*, *Dilochia Cantleyi*, and *Goodyera gracilis*.

Further south we have one mountain of approximately the same height, viz. Mount Ophir, 4,000 feet in altitude, the flora of which is now well known and is very different from that of the main chain and of Měnuang Gasing. Indeed,

there is every evidence that Mount Ophir was never connected with the main chain of the peninsula, or at least not during the period of the evolution of the flora now found on the mountains of the central main range.

The novelties and additions to our flora are mostly of peninsular types, but of more special interest are the Javanese Orchid, *Physurus humilis*, *Forrestia glabrata* (Indo-Malaya), and the Indian *Pratia begoniaefolia*, which, however, was recently obtained on Gunong Kerbau, in Perak; while among the new species, *Oberonia grandis*, probably the biggest species in this large genus, the remarkable *Blastus pulverulentus*, and the new *Balanophora* are the most noteworthy.

List of Plants collected.

POLYPETALÆ.

MAGNOLIACEÆ.

1. *ILLICIAM CAMBODIANUM*, Hance, in *Journ. Bot.* xiv. (1876) 240, [287]*

The flowers rather smaller than usual, and the petals not ciliate on the edge.

Distrib. Common on all the hills at about 4,000 feet elevation.

ANONACEÆ.

2. *GONIOTHALAMUS CURTISII*, King, in *Journ. As. Soc. Beng.* lxi. (1892) ii. 75 (*Mat. Fl. Mal. Pen.* i. 324) [287].

Distrib. Selangor and Perak.

3. *UNONA FILIPES*, Ridl., n. sp. [287].

Arbor 10-12-pedalis, glabra, cortice nigro. *Folia* elliptica, acuta, basibus rotundatis, tenuiter coriacea, superne viridia, subtus glauca, 19 cm. longa, 8 cm. lata, nervorum 15 paribus, petiolis 1 cm. longis. *Flores* singuli, axillares, kermesini vel brunnei, pedicellis filiformibus ad 38 cm. longis. *Sepala* parva, deltoideo-ovata, acuta, 3 mm. longa. *Petala* elongata, linearia, a basi latiore acuminata, ad apices spiraliter torta, angustissima, 15 cm. longa, ad basin 9 mm. lata. *Stamina* antheris oblongis apicibus late triangulariovatis. *Pistilla* lageniformia, dense pilis rufis tecta. *Carpella* matura ellipsoidea, 8 mm. longa, 5 mm. lata, brevissime apiculata, stipitibus 1 cm. longis.

Also in Perak (*Scortechini*, 342); Larut, 2,500 to 3,000 feet alt., 10 to 20 feet tall: flower brown, fruit glossy-green with brown tinge (King's Collector, 5291). Hill garden, medium-sized tree, flowers crimson (*Wray*, 609).

Figures in square brackets [] indicate the pagination of the original paper*

This plant is identified by King (*Mat. Fl. Mal. Pen.* i. 295) with *U. longiflora*, Roxb., a native of Assam and Chittagong. His description in this article and the description and figure in the 'Annals of the Calcutta Garden,' vol. iv. 1. p. 58, pl. 80, do not apply to the Perak plant, which appears to me to be a very distinct species. It differs in its very much longer and more slender pedicels, which in *U. longiflora* vary from $1\frac{1}{2}$ –8 inches in length and are much stouter; in its petals, which are much narrower, narrowing rather abruptly from a broader base into a long filiform point, whereas in *U. longiflora* they are gradually narrowed and linear lanceolate, much broader and only 9 cm. long or little more; in the carpels, which in *U. longiflora* are often moniliform, with the joints elongate and much longer in proportion to their breadth than in *U. filipes*.

4. *POLYALTHIA MONTANA*, Ridl., n. sp. [288].

Arbor ramis tenuibus, cortice nigro, partibus junioribus pilis flavescentibus appressis tectis. *Folia* lanceolata, acuminata, apicibus obtusis, basibus brevius acuminatis, coriacea, nitida, subtus pallidiora, glabra, 15 cm. longa, 45 mm. lata, nervorum paribus 8, reticulationibus conspicuis tenuibus, petiolis pubescentibus 5 mm. longis. *Flores* extra-axillares, singuli, 1 cm. lati, pedicellis 1 cm. longis. *Sepala* parva, ovata, hirta. *Petala* oblonga, ovata, extus hirta, intus glabra, obtusa, serie externa quam interiore breviora. *Stamina* oblonga, connectivo subelliptico, apice canaliculato antheram vix tegente. *Ovaria* pauca, oblonga, hirta, stigmatibus glabris. *Ovulum* singulum. *Carpella* matura ellipsoidea, hirta vel pilis dejectis pustulata, 1 cm. longa, stipitibus 3 mm. longis.

Distrib. Ulu Langat (C. B. Kloss).

Nearest to *P. dumosa*, King, but differing in the venation of the leaves, the petals hairy outside and glabrous within, the connective or appendage of the stamen smaller, somewhat oblong, grooved along the top, and in the form of the fruit. Most of the flowers on the specimens appear to be unisexual and male, having no pistils. The petals appear to have been purple.

POLYGALACEÆ.

5. *POLYGALA VENENOSA*, Juss. in Poir. *Dict. Encyc.* v. 493 [288].

There are two forms in the collection, one the common peninsular form with broad ovate leaves, the other with oblanceolate leaves.

Distrib. Common in the hill-woods above 1,000 feet elevation.

STERCULIACEÆ.

6. *LEPTONYCHIA GLABRA*, Turcz. in Bull. Soc. Nat. Mosc. xxxi. (1858) 222 [288].

Distrib. Common all over the Peninsula.

RUTACEÆ.

7. GLYCOSMIS PENTAPHYLLA, *Correa*, in *Ann. Mus. Par.* vi. (1804) 384 [288].

Distrib. Common all over the Peninsula.

GERANIACEÆ.

8. IMPATIENS ONCIDIODES, *Ridl.* in *Kew Bull.* (1909) 11 [288].

Distrib. This beautiful Balsam seems to be abundant here. It occurs also in Perak and other parts of Selangor.

MELIACEÆ.

9. AGLAIA ODORATISSIMA, *Blume*, *Bijdr.* 171 [289].

Distrib. Common in the Peninsula and Sumatra and Java.

CELASTRINEÆ.

10. GLYPTOPETALUM QUADRANGULARE, *Prain*, ex *King* in *Journ. As. Soc. Beng.* lxxv. 11. (1895) 345 [289].

Distrib. Singapore to Perak.

SAPINDACEÆ.

11. ALLOPHYLUS COBBE, *Blume*, *Rumphia*, iii. 131 [289].

Var. GLABRA. In this form the leaflets are lanceolate to ovate-lanceolate, acuminate at both ends, entire, cuneate at the base, smooth, shining and papery when dry; the petioles, petiolules and rhachis of the inflorescence covered with short stiff hairs; the flowers rather more scattered on the rhachis than usual; the bracts short and the petals fringed with white hairs. I have seen no form exactly like it.

HAMAMELIDEÆ.

12. BUCKLANDIA POPULNEA, *R. Br. Wall. Cat.* n. 7414 [289].

Hills of Pahang and Perak.

Distrib. Himalayas, Burma, Java, Sumatra.

SAXIFRAGACEÆ.

13. POLYOSMA PARVIFLORA, *King*, in *Journ. As. Soc. Beng.* lxxvi. (1898) 11. 300 [289].

I have examined the co-type of this species in the Herbarium at Kew, a plant collected by Wray on Gunong Inas, in Perak. It is in young bud, and I have little doubt that the plant collected by Kloss on Měnuang Gasing is the same in spite of some differences in the original description. King describes the calyx-tube as narrow and nearly glabrous;

but in the type it is distinctly hairy. He gives the flowers as 0.2 inch long. In Kloss's plant, where they are fully open, they are just twice as long, and nearly glabrous, and the petals hardly as long as the anthers. These differences are due, no doubt, to the young state of Wray's plant.

Distrib. Hitherto only known from Gunong Inas.

MELASTOMACEÆ.

14. *SONERILA TENUIFOLIA*, Blume, in *Flora*, xiv. (1831) 491 [289].

Distrib. Common in the hills of the Peninsula, Sumatra, Java, and Borneo.

15. *BLASTUS PULVERULENTUS*, Ridl., n. sp. [290].

Frutex ramis tenuibus. *Folia* ovata, acuminata, basibus cuneatis, superne glabra, 13 cm. longa, 7 cm. lata, stellatim lepidota et glandulis copiosis munita, subtus nervis prominulis 3 ad basin connatis, petiolis 25 mm. longis. *Cyme* axillares vel subterminales, 3 cm. longæ, paucifloræ. *Bractea* lineares, 3 mm. longæ. *Flores* parvi, pedicellis 3 mm. longis. *Calycis* tubus subglobosus, lobis brevibus ovatis 4. *Petala* 4, ovata vix longiora, glabra. *Stamina* 4 æqualia et similia, filamentis petala æquantibus, antheris longioribus curvis acuminatis, basi processibus 2 brevibus obtusis munita. *Stylus* breviusculus, basi stellato-pilosus.

Distrib. Ulu Langat (C. B. Kloss).

This species is very different in appearance from our common *Blustus Cogniauxii*, Stapf, both in habit and larger flowers, and more resembles an *Anerincleistus*, but the four similar and equal stamens distinguish it from that and allied genera.

16. *MEDINILLA CLARKEI*, King, in *Journ. As. Soc. Beng.* lxi. (1900) II. 63 [290].

Distrib. Common on hills from 3,000 to 5,000 feet elevation. Malacca, Perak, Selangor.

17. *MEDINILLA HULLETHI*, King, l. c. 76 [290].

Distrib. Also occurs in Johore.

BEGONIACEÆ.

18. *BEGONIA MEGAPTEROIDEA*, King, l. c. lxxi. (1902) II. 65 [290].

Distrib. Perak.

19. *BEGONIA KLOSSII*, Ridl., n. sp. [290].

Rhizoma validum, repens, elongatum, lignosum. *Folia* longe petiolata, ovata, subabrupte acuminata, basibus rotundatis æquilateralibus, integra, 11.3 mm. longa, 5-6 cm. lata, in dorso furfuracea, aliter glabra, nervorum paribus 5 gracilibus,

petiolis gracilibus 18 cm. longis. *Pedunculus* e rhizomate erectus, subtenuis, ruber, 0.15 cm. longus, squamis lanceolatis acuminatis obtectus. *Flores* masculi 3-4, in pedicellis gracilibus 2 cm. longis. *Bractea* 2, lanceolatae, persistentes, 1 cm. longae. *Sepala* oblonga, subspathulata, apicibus rotundatis, 14 mm. longa, 5 mm. lata. *Petala* angustiora et breviora. *Andræcium* sessile, filamentis gracilibus, dimidio antheræ æquilongis, antheris linearibus obtusis haud apiculatis. *Capsula* triangulari, ala una longiore oblonga oblique rotundata, ad apicem 2 cm. longa 1 cm. lata, alis obtuse triangularibus 5 mm. longis.

The flowers apparently white. This is allied to *B. Robinsonii*, Ridley; but the leaves are quite equilateral and not bilobed. It evidently creeps on tree trunks as does that species, as one specimen shows roots spread out from the rhizome with moss on them.

ARALIACEÆ.

20. *BRASSAIOPSIS ELEGANS*, Ridl., n. sp. [291].

Frutex cortice griseo, partibus junioribus tomento rufo-tectis. *Folia* digitata vel simplicia, foliolis lanceolatis acuminatis, basibus longe angustatis, marginibus minute denticulatis, herbacea, subtus pallidiora, 16 cm. longa, 4-5 cm. lata, nervorum 5 paribus, petiolulis 3 cm. longis, petiolis 13 cm. longis gracilibus. *Stipula* connatae, latae, bidentatae, dentibus acuminatis. *Panícula* longa, laxa, deflexa, gracilis, pedunculo gracili 10 cm. longo cum ramis 4-12 cm. longis rufo-tomentoso, umbellis 1 cm. longis 13-floris, pedicellis florum 5 mm., fructuum 1 cm. longis. *Bractea* lanceolatae, acuminatae, 3 mm. longae, umbellares breviores apicibus brevioribus, omnes rufo-tomentosae. *Calyx* obconicus, dentibus brevibus rufo-tomentosus. *Petala* 5, oblonga, obtusa, parce hirta. *Stamina* 5, brevia, filamentis brevibus, antheris oblongis obtusis. *Stylus* unicus, brevis, crassus, in flore quam stamina brevior, stigmate capitato. *Discus* pulviniformis. *Ovarium* biloculare.

Distrib. Ulu Langat.

This species is allied to *B. speciosa*, DC. & Planch., but is very distinct in its much smaller, more slender inflorescence, and longer peduncles.

RUBIACEÆ.

21. *ADENOSACME LANCEOLATA*, Ridl. in *Journ. Fed. Mal. States Mus.* iv. (1909) 29 [291].

Distrib. Also in Pahang.

22. *ARGOSTEMMA INVOLUCRATUM*, Hemsl. in *Hook. Ic. Pl.* t. 1556 [291].

Distrib. Perak, Pahang.

23. ARGOSTEMMA SPINULOSUM, Clarke, in Hook. f. Fl. Brit. Ind. iii. 46 [291].

Distrib. Also Perak.

24. ARGOSTEMMA HOOKERI, King, in Journ. As. Soc. Beng. lxxii. (1903) II. 155 [291].

Distrib. Also Johore, Penang.

25. OPHIORRHIZA ERUBESCENS, Wall. Cat. n. 6233 [291].

Distrib. Burmah, Perak.

26. OPHIORRHIZA KLOSSII, Ridl., n. sp. [291].

Herba pedalis (30 cm. alta), caule validulo basi glabro, superne velutino-pubescente. *Folia* ovata vel oblongo-lanceolata, acuminata apice obtusa, basi acuminata, glabra nervis in dorso pubescentibus exceptis, superne viridia, subtus pallida, 115 mm. ad 15 cm. longa, 43 mm. lata, nervorum paribus ad 14 in nervum submarginalem junctis, petiolis pubescentibus 35 cm. long *Stipulae* lineares, 5 mm. longæ. *Cymæ* compactæ, nutantes, deflexæ, pubescentes, 1 cm. longæ. *Bractea* persistentes, lineares, dimidio pedunculi æquales. *Pedicelli* breves, pubescentes, ovario breviores. *Calyx* globoso-cupulatus, pubescens, lobis 5 ovatis acutis dimidio tubi æquantibus. *Corolla* tubulosa, crassiuscula, 6 mm. longa, glabra, apicibus paullo pubescentibus exceptis, lobis obtusis $\frac{1}{4}$ tubi æquantibus. *Stamina* 5, glabra, quam corolla breviora, antheris linearibus. *Stylus* longior, stigmate bifido. *Capsula* obreniformis, sinu lato profundo, pubescens, 8 mm. lata, ad sinum 1 mm. alta.

A very distinct species in its rather large flowers in the nodding head, the persistent bracts and the broad linear stipules.

27. KLOSSIA MONTANA, Ridl. in Journ. Fed. Mal. States Mus. iv. (1909) 28 [292].

Distrib. Selangor and Pahang.

28. WEBERA PULCHRA, Ridl. l. c. 33 [292].

The leaves are rather smaller than in the type.

Distrib. Pahang.

29. IXORA KINGSTONI, Hook. f. Fl. Brit. Ind. iii. 140 [292].

Distrib. Johore, Selangor, Perak, Malacca, and Andamans.

30. PAVETTA INDICA, Linn. Sp. Pl. 110 [292].

Distrib. Whole Peninsula.

31. LASIANTHUS WIGHTIANUS, Hook. f. Fl. Brit. Ind. iii. 188 [292].

Distrib. Mt. Ophir.

32. *LASIANTHUS FLAVICANS*, King & Gamble, in *Journ. As. Soc. Beng.* lxxiii. (1904) II. 116 [292].

Distrib. Singapore, Pahang, Perak, and Selangor.

33. *PSYCHOTRIA STIPULACEA*, Wall. in *Roxb. Fl. Ind. ed. Carey*, iv. 164 [292].

Distrib. Common over the whole Peninsula.

COMPOSITÆ.

34. *GYNURA SARMENTOSA*, DC. *Prodr.* iv. 298 [292].

Distrib. Whole Peninsula, Siam, and Malaya.

35. *ADENOSTEMMA VISCOSUM*, Forst. *Char. Gen.* 20 [292].

Distrib. Common, especially in hill-districts.

CAMPANULACEÆ.

36. *PRATIA BEGONIÆFOLIA*, Lindl. *Bot. Reg.* t. 1373 [293].

Distrib. Only previously met with in Gunong Kerbau in Perak, and in India.

VACCINIACEÆ.

37. *VACCINIUM BREVIFLOS*, Ridl., n. sp. [293].

Frutex. *Folia* coriacea, oblanceolata, versus apicem abrupte acuminatum latiora, ad basin angustata, 4 cm. longa, 2 cm. lata, glabra, superne pallida, subtus brunnea (in sicca), nervis 6 ascendentibus, petiolis 4 mm. longis. *Racemi* axillares et subterminales, breves, 2 cm. longi vel minores, rachi et pedicellis pubescentibus, ad bases floriferi. *Bracteæ* ovatae, subacutæ, 4 mm. longæ. *Calyx* cupuliformis, margine integro. *Corolla* extus glabra, cylindrica, lobis brevissimis recurvis rotundatis, 5 mm. longa. *Stamina* breviora 10, filamentis brevibus hirtis. *Antheræ* parvæ, oblongæ, rostris oblongis truncatis ferme æquilongis parallelis, processibus basalibus nullis. *Stylus* crassiusculus, ad basin hirtus, superne glaber, quam corolla brevior, stigmate capitato. *Discus* pulviniformis.

This species somewhat resembles *V. Kunstleri*, but is in all parts much smaller.

MYRSINÆ.

38. *LABISIA PUMILA*, var. *ALATA*, Scheff. *Myrs.* 93 [293].

Distrib. Common in the Peninsula, Borneo, and Sumatra.

39. *ARDISIA ANDAMANICA*, Kurz, *For. Fl.* ii. 108 [293].

Distrib. Andamans and Mergui, south to Johore.

STYRACEÆ.

40. SYMPLOCOS SPICATA, var. MALASICA, C. B. Clarke, in *Hook. f. Fl. Brit. Ind.* iii. 573 [293].

Distrib. Malacca and Perak.

OLEACEÆ.

41. JASMINUM ADENOPHYLLUM, *Wall. Cat.* n. 2876 [293].

Distrib. Apparently a rare plant, only obtained in the Khasiya hills (Wallich) and by Kunstler in Penang.

APOCYNACEÆ.

42. RAUWOLFIA PERAKENSIS, King & Gamble, in *Journ. As. Soc. Beng.* lxxiv. (1908) II. 424 [293].

Distrib. Perak and Pahang.

ASCLEPIADEÆ.

43. DISCHIDIA COCCINEA, *Griff. Notul.* iv. 45 [294].

Distrib. Malacca, Perak.

44. DISCHIDIA ACUTIFOLIA, *Maing. ex Hook. f. Fl. Brit. Ind.* iv. 51 [294].

Distrib. Malacca.

GESNERACEÆ.

45. AGALMYLA STAMINEA, *Blume, Bijdr.* 767 [294].

Distrib. Hills of the Malay Peninsula, Java, Sumatra.

46. ÆSCHYNANTHUS LONGICALYX, *Ridl. in Journ. Str. Br. As. Soc.* xliii. 16 [294].

Distrib. Perak and Selangor.

47. DIDYMOCARPUS HISPIDUS, var. SELANGORENSIS, *Ridl. apud. King & Gamble, in Journ. As. Soc. Beng.* lxxiv. (1909) II. 750 [294].

Distrib. Selangor.

48. CYRTANDROMÆA ACUMINATA, *Benth. & Hook. f. Gen. Pl.* ii. 1020 [294].

Distrib. Malay Peninsula from Tringanu southwards to Selangor.

49. CYRTANDRA PILOSA, *Blume, Bijdr.* 770 [294].

Distrib. Malay Peninsula to New Guinea.

ACANTHACEÆ.

50. STROBILANTHES MAINGAYI, C. B. Clarke, in *Hook. f. Fl. Brit. Ind.* iv. 448 [294].

Distrib. Penang, Perak, Selangor.

51. *PSEUDERANTHEMUM LILACINUM*, Stapf, in *Bot. Mag.* t. 8446 [294].

Distrib. Johore.

52. *PSEUDERANTHEMUM PARVIFLORUM*, Ridl., n. sp.

Suffrutex, glaber. *Folia* late lanceolata, herbacea, utrinque acuminata, subtus pallida, 19 cm. longa, 7 cm. lata, nervorum 11 paribus, petiolis 1 cm. longis. *Panicula* 15 cm. longa, rachi pubescente. *Bractea* breves, 1 mm., lineares, acuminatae. *Pedicelli* breves, vix 1 mm. longi. *Sepala* hirta, linearia, acuminata, 1 mm. longa. *Corolla* 1 cm. longa, crassiuscula, hirta, versus medium gradatim dilatata; labium superius lanceolatum, apice bifido, lobis lateralibus sublanceolatis angustioribus; labium inferius longius, carnosulum, lanceolatum, omnino parce hirtum. *Stamina* 2, antheris in dorso hirtis, loculis haud parallelis inaequalibus, basibus mucronulatis. *Stylus* glaber. *Capsula* 3 cm. longa, pedicellata, apice magno dilatato acuto 7 mm. lato. *Semina* 4, complanata, rugosa.

Allied to *P. breviflos* (C. B. Clarke) Ridl., but differing in foliage and habit.

53. *LEDA LANCIFOLIA*, Ridl., n. sp. [295].

Suffrutex, cortice pallido. *Folia* lanceolata, acuminata, basibus longe cuneatis, aequalia, herbacea, 12 cm. longa, 5 cm. lata, superne glabra, subtus in nervis minute scabro-hirta, nervorum circiter 10 paribus tenuibus, petiolis 1 cm. longis. *Panicula* terminalis, 6 cm. longa, ramis paucis patulis, pauciflora. *Bractea* lineares, 4 mm. longae. *Sepala* linearia, acuminata, acuta, 5 mm. longa, glabra. *Corolla* 15 mm. longa, lobis labii superioris lanceolatis, inferioribus obtusis, lobo medio pilis flavis munito. *Stamina* 2, antheris hirtis muticis subparallelis.

A single specimen with only one corolla remaining, but enough to show that the plant belongs to the genus *Leda*, as separated by C. B. Clarke, and that it is specifically distinct from any other species. The inflorescence is open and spreading, with a few branches and about 7 flowers on short pedicels 2-5 mm. long. The whole of the leaves and panicle dries black.

APETALÆ.

NEPENTHACEÆ.

54. *NEPENTHES GRACILLIMA*, Ridl. in *Journ. Linn. Soc. Bot.* xxxviii. (1908) 320 [295].

Apparently a large-sized form of this species, but without flowers.

Distrib. Pahang and Selangor.

PIPERACEÆ.

55. *PIPER MAGNIBACCUM*, C. DC. in *Records Bot. Surv. Ind.* vi. 5 [295].

Distrib. Perak.

56. *PIPER CANINUM*, Blume, in *Verh. Batav.-Gen.* xi. (1826) 214. f. 26 [295].

The pubescent form, with ovate, nearly cordate leaves.

Distrib. Common all over the Peninsula.

57. *PIPER MURICATUM*, Blume, *Cat. Gew. Buitenz.* 33 [295].

Distrib. Common in forest in the Peninsula.

CHLORANTHACEÆ.

58. *CHLORANTHUS BRACHYSTACHYS*, Blume, *Fl. Jav. Fasc.* viii. 13, 14 [295].

Distrib. Common on hills, India, China, and Malaya.

MYRISTICACEÆ.

59. *MYRISTICA CANTLEYI*, Hook. f. *Fl. Brit. Ind.* v. 110 [296].

A large-leaved, nearly glabrous form.

Distrib. Malay Peninsula.

LAURACEÆ.

60. *LITSEA CINERASCENS*, Ridl., n. sp. [296].

Arbor, cortice ramulorum pallide griseo. *Folia* lanceolata, acuminata, basibus attenuatis obtusis, alterna vel subopposita, tenuiter subcoriacea, superne glabra, subtus cinerea, 21 cm. longa, 5-6 cm. lata, costa nervisque 11-jugatis minute rufo-tomentosis, petiolis crassiusculis tomentosis 5 mm. longis. *Flores* feminei in pedunculis brevissimis, 2 mm. longis, bracteis ovatis lanceolatis tomentosis minimis. *Pedunculi* umbellarum tomentosi, 4-5 mm. longi. *Bractea* involucales 4, ovatae, acutae, extus sericeae. *Umbellulae* 3 in pedunculis crassiusculis sericeis, 3 mm. longae. *Sepala* 6, oblonga, obtusa, extus sericea. *Staminodia* exteriora 6, filamentis longiusculis sericeis, antheris abortivis, interiora 3-breviora, exterioribus ad bases adnata, spathulata, glandulis reniformibus 2 ad basin sessilibus. *Ovarium* parvum, ovoideum, glabrum. *Stylus* filiformis, stigmatate peltato-discoideo sublobato. *Flores* masculi et fructus non visi.

Distrib. Also met with at Telom, Pahang (Ridley, 13781).

Litsea cinerascens seems nearest to *Litsea amara*, Blume, but is much more glabrous than any form of this species, with fewer flowers in the umbels and larger leaves. Gamble, in the

'Materials for a Flora of the Malay Peninsula,' gives the Telom plant under the variety *attenuata* of *L. amara*, but it is very different from the other plants included under that variety, and should have at least a varietal name.

THYMELÆACEÆ.

61. *DAPHNE PENDULA*, Sm. *Ic. Ined.* ii. 34, t. 34 [296].

Distrib. This pretty shrub is not rare in the hill woods of the Malay Peninsula, Burma and Malaya.

BALANOPHORACEÆ.

BALANOPHORA TRUNCATA, Ridl., n. sp. [296].

Rhizoma arcte pustulosum. *Folia* ad basin pedunculi 3, ovato-oblonga, apicibus rotundatis vel emarginatis, 5-15 mm. longa, 9-10 mm. lata, summa 2, oblonga, majora, truncata, 2 cm. longa, 1 cm. lata. *Pedunculus* masculus 7 cm. longus, basi ad 3 cm. nudus, 3 mm. crassus. *Flores* in spica dissiti, circiter 30, sessiles. *Alabastra* transversim oblonga. *Sepala* 2, exteriora transverse oblonga, 4 mm. lata, multo breviora; interiora lineari-oblonga, apicibus incurvis, exterioribus æquilongia, 1 mm. lata. *Andræcium* transverse oblongum, 3 mm. latum, antheris plurime dense congestis, serie una.

The solitary specimen in the collection is a male inflorescence with the leaves and a small part of the rhizome attached. It has no trace of female flowers, and evidently belongs to an unisexual species, such as *B. Polyandra*, Griff., which, however, is a very much larger plant. It is quite distinct from this in the very unequal and dissimilar sepals, the upper and lower ones being much wider and quite truncate, with a long straight edge at the apex.

EUPHORBIACEÆ.

63. *SAUROPUS FORCIPATUS*, Hook. f. *Fl. Brit. Ind.* v. 334 [297].

Distrib. Hill woods of the Malay Peninsula.

64. *ANTIDESMA PENDULUM*, Hook. f. *l. c.* v. 356 [297].

Distrib. Perak.

URTICACEÆ.

65. *ELATOSTEMMA ACUMINATUM*, Brongn. *Bot. Voy. Coq.* III [297].

Distrib. Not rare by mountain streams in the Peninsula.

66. *FICUS SUBULATA*, Blume *Bijdr.* 460 [297].

Distrib. Malay Peninsula and Islands.

ORCHIDEÆ.

67. OBERONIA (§ CAULESCENTES) GRANDIS, *Ridl.*, n. sp. [297].

Caules plures, pedales. *Folia* ensiformia, curva, acuminata, 15—17 cm. longa, 15 mm. lata. *Spicæ* terminales, 15 cm. longæ, ad basin densifloræ, floribus flavidulis subverticillatis. *Bracteæ* lanceolatæ, cuspidatæ; pedicelli 1 mm. æquantes. *Sepala* ovata, acuta. *Petala* oblonga, lanceolata, integra, angustiora. *Labellum* oblongo-obovatum, apice bifido marginibus breviter denticulatis, fovea ovata. *Anthera* late ovata, subrostrata. *Capsula* 5 cm. longa, oblongo-globosa.

Ula Langat.

A very large-sized species, with stems a foot to 18 inches long or more, including the spike, and with about six long curved leaves, scimitar-shaped. Spikes not very crowded, but flowering to the base. Flowers 2 mm. across, apparently yellow. The sepals short and broad, and the lip resembling that of *O. biawrita*, Hook. f.

68. LIPARIS FLACCIDA, *Reichb. f. in Linnæa*, xli. (1877) 45 [297].

In fruit only.

Distrib. Siam, Malacca, Perak, Selangor, and Malay Islands.

69. LIPARIS COMOSA, *Ridl. in Journ. Linn. Soc., Bot.* xxxii. (1896) 229 [298].

Distrib. Perak.

70. ERIA (§ DILOCHIOPSIS) SCORTECHINII, *Hook. f. Fl. Brit. Ind.* v. 809 [298].

Distrib. Hills of Perak and Pahang, at about 4,000 feet elevation.

71. PHREATIA (§ BULBOSÆ) LINEARIS, *Ridl.*, n. sp. [298].

Rhizoma 4 cm. longum, dense pseudobulbis et radicibus tectum. *Pseudobulbi* globoso-conici, 1 cm. longi. *Folia* 2-3 anguste linearia, obtusa, 11 cm. longa, 5 mm. lata, coriacea, basi in petiolum angustata. *Scapus* gracilis, 16 cm. longus, basi ad dimidium nudus, foliis caulinis circiter 4, lanceolatis acuminatis 10 mm. longis exceptis. *Flores* minimi, subremoti. *Bracteæ* anguste lanceolatæ, subulatæ, 2 mm. longæ. *Ovarium* cum pedicello longius quam bracteæ. *Sepala* ovata. *Petala* angustiora, oblonga, subacuta. *Labellum* ovatum, haud unguiculatum, integrum, obtusum, quam sepala brevius.

Ulu Langat.

Very near, if not identical, is a plant collected by Beccari on Mt. Singalan, Sumatra, No. 397 (Herb. Kew.).

This plant most resembles *Ph. listrophora*, Ridl.; the lip is, however, not clawed but ovate, like that of *Ph. minutiflora*, Lindl.

72. *CERATOSTYLIS GRACILIS*, Blume, *Bijdr.* 306 [298].

Distrib. Common all over the Peninsula.

73. *CERATOSTYLIS LANCIFOLIA*, Hook. f. *Fl. Brit. Ind.* v. 826 [298].

Distrib. Apparently rare, having only previously been collected by Scortechini in Perak.

74. *CALANTHE VERATRIFOLIA*, R. Br. in *Bot. Reg.* sub t. 573 [298].

Distrib. Johore and Perak, India, Malay Islands to Australia.

75. *CÆLOGYNE CARNEA*, Hook. f. *Fl. Brit. Ind.* v. 838 [298].

Distrib. Pahang, Selangor, Perak. Common at high altitudes.

76. *DILOCHIA CANTLEYI*, Ridl. in *Journ. Linn. Soc., Bot.* xxxii. (1898) 332 [298].

Distrib. Perak and Pahang, at high altitudes.

77. *PLOCOGLOTTIS JAVANICA*, Blume, *Bijdr.* 381, t. 21 [298].

Distrib. Common all over the Peninsula, Java.

78. *SACCOLABIUM BIGIBBUM*, Hook. f. *Bot. Mag.* 5767 [298].

Distrib. Burmah, Perak, and Pahang.

79. *THRIXSPERMUM MONTANUM*, Ridl., n. sp. [298].

Caulis validus, 15 cm. longus, 6 mm. latus. *Folia* coriacea, lorata, obtusa, 15 cm. longa, 2 cm. lata. *Pedunculus* 45 mm. longus. *Racemus* 15 mm. longus, pauciflorus, vix incrassatus, compressus, bracteis ovatis acutis. *Flores* ad 7, pedicellis 4 mm. longis. *Sepala* oblonga, lanceolata, subacuta. 6 cm. longa, 4 cm. lata. *Petala* angustiora, lanceolata, subfalcata. *Labellum* saccatum, unguiculatum, lobis vix distinctis brevibus truncatis, lobo medio rotundato brevi, calcare conoideo porrecto obtuso. *Columna* brevis, lata, clinandrio late ovato, rostellis lobis brevibus obtusis. *Anthera* ovata, rostro lato truncato-quadrato, pollinibus oblongis obtusis, stipitibus brevibus, disco minuto ovato.

Ulu Langat.

Not very like any species known to me. The lip has a saccate base and the margins are elevated, ending in two short blunt points representing the side lobes; between these at the end is a short rounded lobe representing the mid-lobe, the

spur is conic as in *Th. Calceolus*. The pollinia seem to be sausage-shaped rather than pyriform. The clinandrium is large for the flower, with distinct thick projecting margins.

80. *PODOCHILUS LANCIFOLIA*, *Schlecht. Mon. Pod.* 12 [299].

Distrib. Selangor and Perak.

81. *GOODYERA GRACILIS*, *Hook. f. Fl. Brit. Ind.* vi. 112 [299].

Var. *UNICALLOSA*, *Ridl.*, n. var.

Flores $\frac{1}{2}$ poll. longi. *Labellum* oblongum, cymbiforme, lobo terminali cordato-ovato, callo singulo oblongo, apice rotundato obtuso. *Anthera* longior, magis acuminata, polliniis elongatis pyriformibus, disco lineari ultra dimidium pollinii longo.

This has the exact habit of *G. gracilis*, *Hook f.*, a native of the upper part of the Larut Hills, near Gunong Hijan. I find, however, that the two calli in the base of the lip are connate into one blunt thick round-tipped organ, and that the pollinia are longer and narrower, with the linear disc more than half as long as the pollen-mass.

82. *PHYSURUS HUMILIS*, *Blume, Orchid. Arch. Ind.* 96, pl. 27. 2, 12-13 [299].

A single specimen.

Distrib. New to the Malay Peninsula. Native of Java.

83. *CRYPTOSTYLIS ARACHNITES*, *Blume, Orch. Arch. Ind.* 132, t. 45 [299].

Distrib. Common up to about 4,000 feet in the Malay Peninsula, India, Java, Ceylon.

84. *HABENARIA ZOSTEROSTYLOIDES*, *Hook. f. Fl. Brit. Ind.* vi. 155 [299].

Distrib. Malacca, Perak, and Pahang.

85. *HABENARIA GIGAS*, *Hook. f. l. c.* 160 [299].

Specimen in fruit only, and so doubtful.

Distrib. Perak.

SCITAMINEÆ.

86. *GLOBBA REGALIS*, *Ridl. in Journ. Fed. Mal. States Mus.* iv. (1909) 74 [300].

Base of stem blood-spotted.

Distrib. Pahang.

AMARYLLIDEÆ.

87. *CURCULIGO LATIFOLIA*, *Ait. Hort. Kew.* ed. 2, ii. 253 [300].

Distrib. Burmah, Andamans, Malaya.

LILIACEÆ.

88. *PELIOSANTHES ALBIDA*, *Baker, Bot. Mag. t. 7110* [300].

Distrib. Perak, Penang, and Borneo.

89. *SMILAX ASPERICAULIS*, *Wall. Cat. n. 5129* [300].

Distrib. Perak and Selangor, India and Andamans.

90. *DRACÆNA ELLIPTICA*, *Thunb. Diss. Bot. Drac. 6* [300].

Distrib. Common in the Malay Peninsula; Silhet, Burmah, Andamans, and Malay Islands.

COMMELINACEÆ.

91. *FORRESTIA GLABRATA*, *Hook. in Flora, xlvii. (1864)* 360 [300].

Distrib. India, Tonkin, Java, and Sumatra.

A new addition to our flora.

PALMÆ.

92. *PINANGA POLYMORPHA*, *Becc. Malesia, iii. 173* [300].

Distrib. Perak, Selangor.

93. *PINANGA SCORTECHINII*, *Becc. Malesia, i. 170* [300].

The petals of the male flowers are in this form lanceolate and acute, not ovate.

Distrib. Penang, Perak, Selangor.

94. *IGUANURA GEONOMÆFORMIS*, var. *MALACCENSIS*, *Ridl. Mat. Fl. Mal. ii. 150* [300].

The form with the leaves cut into many lobes.

Distrib. Malay Peninsula.

95. *CALAMUS VIRIDISPINUS*, *Becc. in Hook. f. Fl. Brit. Ind. vi. 458* [300].

Distrib. Perak.

ARACEÆ.

96. *ARISÆMA ANOMALUM*, *Hemsl. in Journ. Bot. xxv. (1887) 205* [300].

Distrib. Perak.

97. *AMORPHOPHALLUS BUFO*, *Ridl. in Journ. Fed. Mal. States Mus. iv. (1909) p. 89* [301].

Distrib. Perak at Telom.

98. *AGLAONEMA SCHOTTIANUM*, *Miq. Fl. Ind. Bat. iii. 316* [301].

Distrib. Burmah, Malay Peninsula, Borneo.

99. PIPTOSPATHA ELONGATA, *Ridl. Mat. Fl. Mal. Pen.* iii. 35 [301].

Distrib. Hills of the Malay Peninsula and Borneo.

100. ANADENDRUM MONTANUM, *Schott, in Bonplandia*, v. (1857) 45; *Prod.* 391 [301].

Distrib. Whole Peninsula, Tenasserim, Borneo.

CYPERACEÆ.

101. SCLERIA RADULA, *Hance, in Ann. Sc. Nat.* ser. 4, xviii. (1862) 232 [301].

Distrib. Perak, Hongkong.

102. GAHNIA JAVANICA, *Mor. Verz. Zoll. Pfl.* 98. [301].

Distrib. High altitudes, Malay Peninsula.

GRAMINEÆ.

103. PANICUM PATENS, *Linn. Sp. Pl.* 86 [301].

Distrib. Indo-Malaya, Polynesia.

104. PANICUM PILIPES, *Nees & Arn.; Miq. Pl. Jungh.* iii. 376 [301].

Distrib. Common in the East from the Mascarene Isles to Polynesia.

105. PANICUM SARMENTOSUM, *Roxb. Fl. Ind.* i. 308 [301].

Distrib. Indo-Malaya, China.

106. PANICUM UNCINATUM, *Raddi, Agrost. Bras.* 41 [301].

Only previously met with at Temengoh.

Distrib. India, Ceylon, Malay Islands, and South America.

107. THYSANOLÆNA ARGOSTIS, *Nees, in Edinb. Phil. Journ.* xviii. (1835) 180 [301].

Distrib. Penang, Perak, Selangor.

108. LOPHATHERUM GRACILE, *Brongn. in Duperr. Voy., Bot.* 50, t. 8 [301].

Distrib. Tropical and Warm Asia.

FILICES.

109. ALSOPHILA COMMUTATA, *Mett. in Ann. Mus.-Lugd.-Bat.* i. 53 [301].

Distrib. Hills of the Malay Peninsula.

110. ALSOPHILA LATEBROSA, *Hook. Sp. Fil.* i. 37 [302].

Distrib. Common all over the Malay Peninsula.

III. HYMENOPHYLLUM JAVANICUM, *Spreng. Syst. iv.* 132 [302].

Distrib. Mascarene Isles, India, Malaya, Australia.

II2. TRICHOMANES PALLIDUM, *Blume, Enum. Pl. Jav.* 225 [302].

Distrib. Common on all the hills of the Peninsula; Java.

II3. TRICHOMANES RIGIDUM, *Sw. Prodr.* 137 [302].

Distrib. Most of the Tropics.

II4. TRICHOMANES PLUMA, *Hook. Ic. Pl. t.* 997 [302].

Distrib. Common on the hills at 4,000 feet alt.; Malaya Islands.

II5. TRICHOMANES MAXIMUM, *Blume, Enum. Pl. Jav.* 228 [302].

Distrib. Malay Peninsula and Islands and Polynesia.

II6. TRICHOMANES AURICULATUM, *Blume, Enum. Pl. Jav.* 225 [302].

Distrib. Selangor and Perak, Malay Isles, Japan, and Guiana.

II7. LEUCOSTEGIA NODOSA, *Bedd. Ferns Brit. Ind. Suppl.* 4 [302].

Only hitherto recorded from Gunong Buba in Perak.

Distrib. India and Java.

II8. DAVALLIA DIVARICATA, *Blume, Enum. Pl. Jav.* 237 [302].

Distrib. Rare. Perak, also Java.

II9. LINDSAYA FLABELLULATA, *Dryand. in Trans. Linn. Soc. iii.* (1797) 41 t. 8. f. 2 [302].

Distrib. Tropical Asia and Australia.

120. LITOBROCHIA INCISA, *Presl. Tent.* 149 [302].

Distrib. Tropics generally.

121. BLECHNUM ORIENTALE, *Linn. Sp. Pl. ed. 1,* 1077 [302].

Distrib. Eastern Tropics.

122. ASPLENIUM HIRTUM, *Kaulf. Enum. Fil.* 169 [302].

A large form with long acuminate pinnæ.

Distrib. Malaya, Madagascar, Mascarene Islands, Seychelles, Polynesia.

123. A. NITIDUM, *Sw. Syn. Fil.* 280 [302].

Distrib. S. Africa to Indo-Malaya.

124. *A. TENERUM*, *Forst. f. Prod.* 80 [302].
Distrib. Ceylon, Malaya, and Polynesia.
125. *ASPLENIUM AMBOINENSE*, *Willd. Sp. Pl.* v. 303 [303].
Distrib. Mergui, Tavoy, Polynesia.
126. *DIPLAZIUM BANTAMENSE*, *Blume, Enum. Pl. Jav.* 191 [303].
Distrib. Indo-Malaya, China.
127. *DIPLAZIUM TOMENTOSUM*, *Blume, Enum. Pl. Jav.* 192 [303].
Distrib. Common. Burmah, Malaya.
128. *DIDYMOCHLÆNA LUNULATA*, *Desv. in Mém. Soc. Linn. Paris*, ii. (1827) 282 (303).
Distrib. Malay Peninsula, Burmah, Mascarene Islands, Polynesia, America.
129. *MESOCYLÆNA POLYCARPA*, *Bedd. Ferns Brit. Ind. Suppl.* 13 [303].
Distrib. Malay Peninsula and Islands.
130. *ASPIDIUM PACHYPHYLLUM*, *Kunze, in Bot. Zeit.* 1848. 259 [303].
Distrib. Malay Peninsula and Islands.
131. *LASTRÆA IMMERSA*, *T. Moore, Index Fil.* p. lxxxix [303].
Distrib. Malay Peninsula and Islands.
132. *LASTRÆA CALCARATA*, *T. Moore, Index Fil.* 87 [303].
Distrib. India and Malaya.
133. *LASTRÆA SPARSA*, *T. Moore, Index Fil.* 104 [303].
 A new record for the Malay Peninsula.
Distrib. India, Ceylon, Malay Isles, China, Mauritius.
134. *NEPHRODIUM HETEROCARPUM*, *T. Moore, Index Fil.* 93 [303].
Distrib. Malaya.
135. *NEPHROLEPIS DAVALLIOIDES*, *Kunze, in Bot. Zeit.* 1846, 460 [303].
Distrib. Malay Peninsula, Java.
136. *OLEANDRA NERIIFORMIS* *Cav., in Anal. Hist. Nat. Madrid*, i. (1799) 115 [303].
Distrib. Common on our hills above 3,000 feet.

137. POLYPODIUM HIRTELLUM, *Blume, Enum. Pl. Jav.*
123 [303].

Distrib. Hills at 4,000 feet, also Ceylon.

138. GYMNOGRAMMA CALOMELANOS, *Kaulf. Enum. Fil.* 76
[303].

Distrib. Tropics, Natal.

139. ELAPHOGLOSSUM LAURIFOLIUM, *T. Moore, Index Fil.*
p. xvi [303].

Distrib. Tropical Asia, Mascarene Islands.

140. ANGIOPTERIS ERECTA *Hoffm. Comm. Soc. Reg. Gott.*
xii. 29, t. 5 [303].

Distrib. Madagascar, Indo-Malaya, Japan, Polynesia.

LYCOPODIACEÆ.

- 141 SELAGINELLA WALLICHII, *Spring, Mon.* ii. 143 [304].

Common in the hill districts.

Distrib. Indo-Malaya.

MUSCI.

142. POGONATUM MACROPHYLLUM, *Dozy & Molkenb. Bry.*
Jav. i. 45, t. 35 [304].

Distrib. Malay Archipelago.

143. RHIZOGONIUM SPINIFORME, *Bruch, in Flora*, xxix.
(1846) 134 [304].

Distrib. Throughout the tropics.

Both these mosses are common in the Malay Peninsula.

II. AEROMYS, A NEW GENUS OF FLYING-SQUIRREL.

By HERBERT C. ROBINSON, C.M.Z.S. and
C. BODEN KLOSS, F.Z.S.

We have recently been fortunate enough to obtain several fresh examples of the rare Flying-squirrel described by Günther (P.Z.S. 1873 p. 413, pl. xxxvii) as *Pteromys tephromelas*. On examination these prove to possess so many distinct characters as to require the erection of a new genus for the reception of this and the allied species *Pteromys phaeomelas*, Günther, from Borneo, which we have also inspected. We have characterized this below and propose that it should be known as

AEROMYS, genus nov.

Large to medium sized flying-squirrels, having the external appearance of *Petaurista* and the dentition of the *Sciuropterus* group.

Tail cylindrical, non-distichous, the base contained in the interfemoral membrane. Antebrachial membrane present. Soles naked except the heel. Digits hairy beneath.

Skull generally resembling *Petaurista* but less robust and narrower. Bullae not constricted mesially and more triangular in outline. No palatal spine. Zygomatic plate, as in the *Sciuropterus* group, lacking a pronounced post-orbital point.

Teeth markedly different from those of *Petaurista*, more nearly agreeing with *Hylopetes*. Crowns not flat, with two transverse ridges meeting on an elevated cusp on the inner margin of the upper teeth: no deep transverse notch at the postero-internal angle. Sides of ridges sculptured and wrinkled, p^3 well developed, interior to the anterior extremity of p^4 . p^4 about equal in area to m^1 .

Type—*Aeromys tephromelas* (*Pteromys tephromelas*, Günther) from the Malay Peninsula.

Other species: *Aeromys phaeomelas* (Günther), from Borneo.

III. MALAY FILIGREE WORK.

By I. H. EVANS, B.A. *Assistant Curator and Ethnographical Assistant F.M.S. Museums.*

By the courtesy of Mr. R. O. Winstedt, District Officer, Kuala Pilah, the writer was recently enabled to visit a Malay goldsmith at the village of Berlombong, about three miles from Kuala Pilah. The art of making gold filigree was, until recently, supposed to be dead in the Federated States, but Mr. Winstedt has lately discovered several smiths in Negri Sembilan who are capable of turning out this class of work, *Tukang Adam*, the man visited at Berlombong, being one of them.

There is an excellent account of the manufacture of Malayan gold filigree work in Marsden's "History of Sumatra" (pp. 178-180), and this is reproduced in Mr. Winstedt's pamphlet on Malay Industries in the series of papers on Malay subjects published by the F.M.S. Government.

The present short article has little claim to add anything new to the subject, except perhaps, the *pendinding* prayer used by the smith, but it may be useful as confirming Marsden's observations, which were made more than a hundred and thirty years ago, and showing that the same methods still prevail.

Before starting work upon the raw gold the smith repeats the following spell or prayer in order to shield himself from all harm.

Allah tuhanku, rasul Allah.

Di-hadapan aku Raja Jibrail,

Di-kiri di-kanan 'ku segala sidang malaikat.

Meninding aku Salam laut sipat-u'llah.

Ya, Musa kalam u'llah,

Ya, hanan,-ya dayan;

Ya-sin dalam koran tiga-puloh.

Tutup terkunchi hati mulut

Barang barang satu bahaya 'kan lawan-ku;

Těrbuka, tėrkěmbang segala pintu řěžěki-ku.

Tajam měngadap aku lagi tumpul;

Bisa měngadap aku lagi tawar;

Gunching (Kanching?) pada hadap aku lagi *momah* (mamah?).

Aku dalam kandang kalimah.

La-ilaha-ila-lla, Muhamad rasul Allah.

* Oh Allah, my God ; oh, prophet of God ;
In front of me is prince Gabriel ;
Right and left of me the whole company of angels.
My fences the Lord of the sea, the chosen (protecting)
line of God.

Oh Moses, God's scribe.

Oh Merciful, Gracious.

God's word in the thirty chapters of the Koran.

Shut and locked be the hearts and the mouths

Of those who'd imperil me ;

Open spread wide be the gate of mercies to me.

Let the sharp become blunt at my presence,

The venomous become robbed of its venom ;

Iron bolts (?) as chewed food (?)

I stand in the fold of the faith.

There is no God but Allah and Mahomed's his Prophet.

The tools used by the smith are few and primitive, merely consisting of an iron plate bored with holes of different sizes, used for drawing down gold wire to the required size, three pairs of native or Chinese made pincers, a pair of forceps, a small anvil set in a block of wood and two or three hammers of different sizes. The gold is melted in a crucible on a rectangular open hearth of earth, and the charcoal fire blown up by a horizontal box bellows†. A pipe from the middle of the latter leads to the hearth centre, passing under an arch of hardened clay. In addition to the open hearth the smith uses a paraffin flare and a blowpipe for softening small pieces of gold, the flare being simply an old beer bottle, supported at an angle of about thirty-five degrees, with a rag stuffed into its mouth to act as a wick.

The first thing to be done in making a filigree ornament is to get ready the gold backing‡ (*tapak*) to which the fine wire patterns are to be affixed. When a sheet of gold has been cut to the size and shape required for this, the smith proceeds to draw down the wire used in making the filigree. This is a long and tedious process. A piece of gold is first

* I have to thank Mr. R. O. Winstedt for helping me to make a correct translation of this prayer.

† Bamboo tubes, called *tropong*, are used in addition for blowing up the fire.

‡ Marsden calls this *papan*.

roughly hammered out into a wire of considerable thickness and an end is passed through one of the largest holes in the iron plate mentioned above; the wire is then pulled through with the aid of a pair of pincers. All the holes on one side of the plate have their mouths enlarged into cup-shaped depressions of various sizes. A little cocoanut oil is put into the depression with a feather before the wire is drawn through the hole, and as the wire is threaded in from the side on which the depressions are, any gold which may be stripped off in the process of drawing is left behind in the cup and adheres by reason of the oil. The drawing process is repeated again and again, a smaller hole being used each time. Occasionally the wire becomes too hard to stand further fining down without breaking, and the smith then lights his paraffin flare, rolls the wire into a coil, places it on a block of charcoal and softens it by means of the flame and small brass blowpipe (*penyup*). Each time the wire is put through a smaller sized hole the end of it has to be cut or scraped with a sharp knife, until its circumference is sufficiently small for enough of it to pass through to afford a hold for the pincers. The drawing down process is continued, —the refuse gold being occasionally scraped out from the cups and deposited in a small cocoanut shell, plate or dish,—until the wire is rather finer than an ordinary piece of sewing cotton, when it is considered ready for the next process. This consists in giving the prepared wire a twist, as Marsden observes, "like that in the handle of a whalebone punch ladle," and this is obtained by rolling the wire on a block of wood under a flat stick. When the twisting is finished, the wire is lightly tapped with a hammer until it is slightly flattened. The smith is then ready to be composing the filigree (—*karangan*; i.e. composition). A long piece of plain flattened wire is first taken and a sufficient length cut from it to form a boundary round the edge of the *tapak*. This is bent into shape and fastened on edge in the required position with a kind of glue (*getah kenderi*), which is made from a small red seed with a black spot on it, said to be the fruit of a climbing plant (*akar*) called *Kenderi* *. Borax powder (*pejar*), used as a flux, and filings from a block of alloy of gold, silver and brass, are spread evenly along the wire, which is fixed down to the backing with tiny little clamps, made from small strips of iron, bent double. Heat is next applied by means of the flare and blowpipe, and the alloy, acting as a solder, fuses with the wire and the metal of the backing. The clamps are then taken off, an inner edging of twisted wire arranged as before, and the clamps put back. When this has also been soldered into position in the same manner, the clamps are finally removed, and the smith begins the work

* The composition of this alloy is 4 parts gold, to 1 part silver and 1 part brass. A small square block of the alloy is fixed into the side of a stick of wood, which acts as a holder for it when it is being filed.

Probably *Abrus precatorius*

of setting in the patterns of the *karangan*. For these he bends up the twisted and flattened wire with the forceps into the required shapes for the patterns, cutting off each little portion of pattern as it is made. When he has thus got enough pieces to do a large section of the work he moistens them with the "getah" to make them stick, and sets them in position on the gold backing with the forceps. This arrangement being finished, he covers all the *karangan* evenly with the mixture of borax and solder, and heats it with the blowpipe flame until the wires have become attached to the back plate. Large pieces of the *karangan* are thus done at one time, and when the whole of it is completed the only thing that remains to be done is to clean up the work. Small round balls, called fishes eggs (*telor ikan*) made by fusing a little gold dust on a piece of charcoal, or tiny circular gold discs, called pepper seeds, (*biji lada*), made by flattening the aforesaid balls, are frequently applied to the filigree as ornaments, being affixed in exactly the same way as the gold wire. Newly made ornaments are cleaned and then (purposely) dulled by letting them simmer in a solution of alum (*tawas*), brushing them, covering them with alum paste and putting them on a charcoal ember for a few minutes, before brushing them again.

The dulling process is called *sepoi kuning* (yellow *sepoi*), as opposed to *sepoi merah* (red *sepoi*) a red colouring, much appreciated by Malays, which is frequently given to gold articles. This can be produced by two or more methods. One way, that used by *Tukang Adam*, is to make a solution of borax (*pijar*) and a green crystalline substance obtained from the Chinese shops, probably green vitriol which is called either *tunjong* or *gunjar*. The articles to be coloured are dipped several times alternately into the solution and into hot water, and then cooked for a short time on a charcoal ember. The result is that a dark purplish-red deposit forms all over the gold of the ornaments. In another method a mixture of saltpetre and sulphur is employed; but this was said to be troublesome to use.

The chief articles to which filigree work is applied are the mountings of kris, or dagger hilts, the tops of small boxes for holding chewing requisites, the ends (*buntut*) of kris sheaths, rings, brooches, buttons, small clasps used instead of buttons, gold beads for threading as necklaces, ear studs, and pendants (*dokoh*). Silver filigree work is sometimes to be obtained, that from Upper Perak and the so-called Patani States being particularly fine.

IV. ON TWO NEW BIRDS FROM THE SOUTHERN PORTION OF THE MALAY PENINSULA.

By HERBERT C. ROBINSON, *M.B.O.U.* and
C. BODEN KLOSS, *M.B.O.U.*

In 1911 (*Ibis*, p. 79) we recorded the dull coloured little Flower Pecker, *Piprisoma modestum* (Hume), from Trang in the north of the Malay Peninsula, noting this locality as the most southerly hitherto recorded and, somewhat incautiously perhaps, stating that it certainly does not occur in that portion of the Malay Peninsula under British influence.

In this, however, we were in error, as amongst a collection obtained by the Museum collectors in January, 1913, at Bukit Tangga in Negri Sembilan, on a pass on the main Peninsular divide at about 1,500 ft. altitude occur four specimens of what are certainly this species. They, however, present sufficient differences from two specimens from Trang to merit separation as—

PIPRISOMA MODESTUM subsp. REMOTUM, subsp. nov.

Differing from the typical race in having the whole of the upper surface, sides of the head and outer aspect of the wings duller and darker grey, with less tinge of olive green. White on outer tail feathers perhaps rather less extensive, but this character not very marked. Total length, 3.8; wing, 2.37; tail, 1.4; bill from gape, 0.43 inches.

Type—Adult male, Bukit Tangga, Negri Sembilan, 1,500', 27th January, 1914 (*nat. coll.*) F. M. S. Mus. No. 1/14. Two other males and a female from the same locality examined.

Remarks: Bukit Tangga is nearly 400 miles distant from the nearest locality from which *P. modestum* has been obtained, otherwise we should have hesitated to describe this form on distinctions which are somewhat fine, though quite obvious in the four specimens before us.

RHINOMYIAS TARDUS, sp. nov.

In September 1913 the Museum collectors obtained on Bukit Tamin, a hill in Negri Sembilan near the Malacca boundary rising to 2,500 ft., two examples of an unknown species of *Rhinomyias*, and in the same month of the present year they collected a third specimen at Genting Bidai, 2,300 ft., a pass in the main range between Selangor and Pahang.

This species, which may be known as *RHINOMYIAS TARDUS, sp. nov.* differs from *R. pectoralis*, the only other species inhabiting the Malay Peninsula, in being more olivaceous throughout, the tail and edges of the wing feathers alone

having a slight rufescent tinge. On the under-surface the breast-band, light olive-brown in colour, is much broader, extending over the chest to the abdomen and flanks, and the white throat patch is less clear, being slightly washed with the colour of the chest and sides of neck, while the lower abdomen is pale ivory yellow.

The bill, as compared with that of *R. pectoralis*, has the upper mandible slightly less keeled and the lower is pale, not blackish.

Length of wing, 80 mm; tail, 61; tarsus 16.7; bill from gape, 20.5.

Dr. E. Hartert, who has examined the two individuals from Tampin (an adult and a slightly immature female) has kindly sent us the following remarks: "The new form resembles much more the large-billed *Rh. colonus*, Hartert, from Sula Mangoli and *Rh. nicobaricia* from the Nicobars (than *R. pectoralis*). It differs, however, from *Rh. colonus* chiefly in the tail, which is brown and not chestnut rufous, and from *Rh. nicobarica* also in the less rufescent edges to the rectrices, somewhat more olivaceous back and rump and a little darker chest-band. It agrees with both the latter in the lower mandible being *light in the adult birds*." In these two individuals the abdomen lacks the yellow tinge of the male.

Type: Adult male, Genting Bidai, Selangor-Pahang Boundary, Malay Peninsula, 2,300 ft. 19th September 1914, F. M. S. Mus. No. 157/14.

V. ON THE SPECIES OF MINIVETS
(PERICROCOTUS) OCCURRING IN
THE MALAY PENINSULA.

By HERBERT C. ROBINSON, C.M.Z.S., M.B.O.U.

The species of the genus *Pericrocotus* or Flycatcher Shrikes are amongst the most brilliant and attractive of Oriental birds and much attention has, as a consequence, been paid to them both by systematists and collectors. Owing, however, to the fact that the characters relied on to separate the species are, in many cases, variable within the species, the distinctions between certain of the allied forms are by no means so clear as might be desired, and a good deal of confusion exists as to the actual range and occurrences of several of the Malayan species.

The F. M. S. Museums possess very large series of all the species from the Malay Peninsula, and in the present paper I have attempted to arrange these and the synonymy belonging them without in any way claiming any originality of treatment.

KEY TO THE SPECIES.

- A. Plumage with no red or yellow— *P. cinereus*, p. 32.
- B. Plumage mainly red or yellow—
 - a. The central tail feathers entirely black in the male:
quill lining yellow ... *P. igneus*, p. 32.
 - b. The central tail feathers partly
red in the male, quill lining
red
- AI. With no isolated red or yellow
marks on the outer webs of the
tertiaries ... *P. montanus*, p. 33.
- BI. With isolated red or yellow marks
on the outer webs of the tertia-
ries
 - a. Larger, wing as a rule exceed-
ing 85 mm. ... *P. zanthogaster*
flammiifer, p. 35.
 - b. Smaller, wing less than 85
mm. ... *P. zanthogaster*
zanthogaster, p. 37.

PERICROCOTUS CINEREUS. The Ashy Minivet.

Pericrocotus cinereus, Lafr.; *Hume, Stray Feath.* v, p. 175, 176 (1876); *Sharpe, Cat. Birds, Brit. Mus.* iv, p. 83 (1879); *Ogilvie, Grant, Fascic. Malay. Zool.* iii, p. 90 (1905); *Robinson, Hand-list Birds Malay Pen.*, p. 14 No. 394 (1910); *Robinson & Kloss, Ibis*, 1911, p. 55.

Adult male.—Whole under surface and under tail coverts and crown to behind the eye, white, inclining to ashy on the lower surface; lores, a stripe through the eye, hind, crown and nape glossy black; mantle, back, upper tail coverts, lesser and inner wing coverts and tertials clear grey; tail feathers blackish grey, all except the two median pairs with the terminal portions largely white, increasing in extent towards the outer pairs. Primaries and secondaries blackish brown, with a broad diagonal band of white on the inner webs except on the outer primary, increasing interiorly; bases of the secondaries broadly white. Primary coverts blackish, the innermost broadly edged with grey on the outer webs. Outer axillaries whitish, inner slate grey broadly tipped with white, inner wing coverts mingled white and slate grey.

Adult female.—The series before me, if the sexing is to be relied on, indicates that the adult female only differs from the other sex in having the white frontal band considerably narrower, not extending beyond the eyes.

Immature.—Immature birds of both sexes, which in the Malay Peninsula are in the large majority, differ from the adults in lacking the clear white frontal band; the lores, occiput and nape are ashy grey, not glossy black, and the primaries and central tail feathers are more brownish.

Dimensions.—Adult male: total length, 7.1; wing, 3.6; tail, 3.7 in.

Adult female: total length, 7.2; wing, 3.7; tail, 3.75 in.

Localities in the Peninsula.—Siamese Malay States: Trang (December, January, February). Pulau Langkawi (November, December). Penang (March). Perak: Temerloh (January). Selangor: Klang Gates (January); Kuala Lumpur (December, February, March); Kuala Langat, Batu (November, December); Pulau Pintu Gedong (October). Pahang: Krau River (November).

Note.—As the above dates show this species is not resident in the Malay Peninsula but only appears during the winter months, when it often occurs in considerable numbers, especially on the coast.

PERICROCOTUS IGNEUS. The Fiery Minivet.

Pericrocotus igneus, Blyth; *Sharpe, Cat. Birds Brit. Mus.* iv, p. 78 (1879); *Robinson, Hand-list Birds Malay Penins.* p. 14, No. 393 (1910).

Adult male:—Head all round, throat, mantle, greater part of the primaries and secondaries, wing-coverts, centre pair of tail feathers greater part of the second innermost pair and the bases of the other pairs in a lessening degree glossy black. External aspect of the wings with a broad diagonal bar of orange red, starting on the fourth primary and extending to the innermost tertials, the last tertial only entirely black; inner aspect of the wing with a similar lemon yellow bar formed by patches on the inner webs of the primaries and secondaries; rump and upper tail coverts, under surface except the throat and those parts of the tail feathers that are not black, vermilion orange, more crimson on the rump, the bases of the feathers chrome. Axillaries and under wing coverts, chrome, tipped with orange red, their bases black, thighs black. Angle of the wing orange chrome.

Adult female:—Those portions of the plumage that are glossy black in the male, grey with a faint yellowish cast, blacker on the wing and tail feathers; a frontal band and eye ring orange chrome, this colour extending as a short superciliary beyond the eye. Under surface chrome yellow, under wing coverts and wing band similar, lower back and upper tail coverts vermilion, light portion of the tail orange yellow, suffused with vermilion, thighs mingled greyish and yellow.

Immature:—Resemble the female but are brownish above, each feather edged with yellowish white, frontal band and eye ring absent; beneath pale fuscous faintly barred with brownish white, the middle of the abdomen pale yellow.

Dimensions:—Adult male: total length, 5.75; wing, 2.9; tail 2.8 in.

Adult female: total length 5.5; wing 2.75; tail 2.8 in.

Localities in the Peninsula:—Siamese Malay States: Bandon, Ban Kok Klap (July). Perak: Temongoh (July); Parit (September). Selangor: Ulu Gombak (September); Klang Gates (January); Ginting Bidai, 2,300' (May); Cheras (March). Negri Sembilan: Gunong Tampin (September). North Johore: Segamat, Padang Tuan (September). East Johore: Tanjong Leman (June).

Notes:—This species is resident and breeds in the country apparently from May to June. It is fairly common along the east coast among Casuarinas and in forest country up to about 2,500' but is everywhere much scarcer than either *P. montanus* or *P. xanthogaster*, nor is it found in such large flocks.

PERICROCOTUS MONTANUS. Wray's Minivet.

Pericrocotus montanus, *Ann. Mus. Civ. Gen.* xiv, p. 205 (1879) (*Mt. Singalan, W. Sumatra*); *Sharpe, Ibis*, 1889, p. 193 (*Kinabalu, N. Borneo, 8,000'*); *id Ibis*, 1892, p. 435 (*Mt. Dulit, Borneo, 5,000'*); *Salvad. Ann. Mus. Civ. Gen.* (2) xii, p. 54 (1891) (*Toba Lake, Central Sumatra*); *Hartert Nov. Zool.* ix, p. 554

(1902) (*Gunong Tahan, Pahang*); Ogilvie Grant, *Fascic. Malay Zool.* iii, p. 91 (1905) (*Perak, Pahang Boundary, 4,000'*); *id.* *Journ. Fed. Malay States Mus.* iii, p. 34 (1908); *Robinson tom. cit.* ii, p. 192 (1908); *id.* *Hand-list Birds Malay Penins.* p. 14, no. 391 (1910).

Pericrocotus cinereigula, Sharpe, *Ibis*, 1889, p. 192; *Whitehead, Exploration, Kinabalu*, plate to p. 40 (1893).

Pericrocotus wrayi, Sharpe, *P. Z. S.* 1888, p. 269, pl. xv (*Batang Padang Mountains*).

Pericrocotus croceus, Sharpe, *P. Z. S.* 1888, p. 269 (*Gunong Batu Puteh, S. Perak*); *Bonhote, P. Z. S.* (i) 1901, p. 60 (*Gunong Inas, N. Perak*); Ogilvie Grant *Fascic. Malay Zool.* iii, p. 91 (1905) (*Perak-Pahang boundary, 4,000'*).

Adult male.—Head, nape, mantle, inner and lesser wing coverts shining black; ear coverts, sides of the face and throat dark grey. Primaries and secondaries the bases of all the tail feathers and the greater part of the two median pairs, black; greater inner wing coverts with their terminal portions scarlet; Primaries and secondaries from the fifth primary inwards with their outer webs edged with scarlet, increasing progressively inwards, the basal half of both webs scarlet orange. Rump and upper tail coverts scarlet, under surface except the throat and portion of the tail that is not black, scarlet orange, thighs mingled black and orange buff or apricot; wing lining edge of the wing and axillaries orange. Bill and feet black, iris dark hazel.

Adult female.—Distribution of colour similar to that of the male, the red throughout being replaced by yellow intermediate between "Cadmium Yellow" and "Light Cadmium" of Ridgeway. The black of the upper surface more greyish blue and less shining than that of the male and the ear coverts of a paler grey. Chin and upper throat greyish white. Thighs mingled white and brownish black. This is the stage described as *P. croceus* by Ogilvie Grant (*Fascic. Malay. loc. cit. p. 91.*)

Immature.—The immature of both sexes are similar to the adult female, except that the head and mantle are of a paler grey, with much less gloss and the yellow of the rump and upper tail coverts has a strong cast of olive, while the bases of the feathers are broadly grey, giving an impression of ill-defined cross barring. This is the stage figured by Sharpe (*loc. cit.*) as the adult female of *P. wrayi*. The adult male plumage appears to be attained from this stage in part by a moult of the yellow feathers and in part at least by a direct colour change, though by the majority of authorities on moulting this is roundly asserted to be impossible.

Juvenile.—Younger birds still resemble the immature female but have a greenish tinge over the grey of the upper parts, the ear coverts even paler grey and the feathers of the head and mantle narrowly edged with dirty white.

Dimensions.—Adult male—Total length, 6.7; wing, 3.15; tail 3.9 in.

Adult female—Total length, 6.7; wing, 3.1; tail, 3.8 in.

Localities in the Peninsula. Perak: Larut Hills, 3—4,000' (October); Gunong Kerbau, 5,000' (March); Telom, Perak Pahang Boundary 3—4,000' (September, November, December). Pahang: Gunong Tahan, 5,000' (July). Selangor: Bukit Fraser, 4,000' (October); Semangko Pass, Selangor, Pahang border (February, March, November) Gunong Mengkuang Lebah, 5,000' (January, March); Gunong Menuang Gasing, Ulu Langat, 4,000' (May). Elsewhere common in the high mountains of Borneo and Sumatra.

Notes.—As the synonymy shows this species which is fairly wide, ranging over elevated land in the Malayan region, has received numerous names, partly owing to the fact that the colour of the throat in the male is very variable, ranging from a light grey to an almost glossy black, while the immature birds of both sexes differ from the adult female.

The large series before me, which includes topotypes of Salvadori's *P. montanus*, comprises specimens which can be referred to all the nominal species from one and the same locality and all, therefore, have to be included under Salvadori's as the earliest name, as has already been pointed out by Hartert. Judging from the dates of immature skins in the Museum the species probably begins to breed in the Peninsula about December or January.

***Pericrocotus xanthogaster*, subsp. *flammifer*.**

Davison's Minivet.

Pericrocotus flammifer, Hume, *Stray Feath.* iii, p. 321 (1875); *id op. cit.* v, pp. 175, 195 (1877); Hume & Davison, *op. cit.* vi, p. 211; Sharpe, *Cat. Birds Brit. Mus.* iv, p. 74 (1879); Oates, *Faun. Brit. Ind. Birds*, i, p. 477 (1889); Ogilvie Grant, *Fascic. Malay. Zool.* iii, p. 91 (1905); Robinson, *Journ. Fed. Malay States Mus.* ii, p. 192 (1908) Robinson & Kloss, *Ibis*, 1911, p. 54.

Pericrocotus speciosus fraterculus (nec. Swinhoe), Butler, *Journ. Straits Branch Royal. Asiat. Soc.* No. 32, p. 17 (1899); Hartert, *Nov. Zool.* ix, p. 555 (1902).

Adult male.—Head all round, nape, mantle, throat, outer and lesser wing coverts glossy black. Inner webs of central pair of tail feathers and bases of the remainder, black, the black lessening towards the outer pairs. Primaries, secondaries and tertials black, with an oblique bar of crimson scarlet on the primaries, beginning on the outer web of the fourth primary; secondaries and all but the innermost tertials with their basal halves scarlet; the inner tertials with isolated drops of scarlet on their outer webs; inner primary coverts

with their terminal two-thirds scarlet; axillaries and under wing coverts orange, the bases of the former black; thighs black; rest of the plumage brilliant scarlet orange, more scarlet on the rump and upper tail coverts, the bases of the feathers of the abdomen orange chrome. Bill and feet black, iris dark hazel.

Adult female.—Head behind the level of the eyes, nape, mantle and scapulars grey, slightly suffused with greenish. Forehead to the eyes, a patch round the eyes and a short superciliary stripe, extending slightly beyond the eyes bright chrome yellow. Stripe from the nostrils to the eyes, blackish. Lower back, rump and upper tail coverts, greenish yellow. Whole under surface bright chrome yellow, the lower of the feathers of the abdomen white; the thighs mingled brownish and yellow. Wings black, the first four primaries uniform on the outer web, the remainder with a diagonal chrome yellow bar. Secondaries and tertiaries with their basal third chrome yellow and with elongated isolated drops of the same colour on the outer webs. Lesser wing coverts greyish, except on the angle of the wing; greater ones black, their tips chrome yellow. Under wing coverts pale yellow and fuscous, the axillaries yellow with their bases, blackish. Innermost pair of tail feathers entirely black, the next pair mainly black, the third pair about half black, the black regularly diminishing to the outermost pair in which only the basal third or fourth is black; remainder of the feathers pure chrome yellow.

Dimensions.—Adult male. Total length, 6.75; wing, 3.38; tail, 3.25 in.

Adult female. Total length, 6.75; wing 3.4; tail, 3.25 in.

Immature.—The not fully adult birds of both sexes resemble the adult female, from which garb the male changes into the adult dress in part by a deepening of the pure yellow feathers to orange and thence to vermilion scarlet, this change being very well shown in the large series in the Selangor Museum. Still younger birds have the yellow colour beneath duller, the feathers of the head and mantle with white margins, and the primaries edged with white.

Localities in the Peninsula:—Siamese Malay States: Bandon (June); Trang (November, December, January). Perlis: Pelarit (November). Perak: Temongoh (July); Taiping (July). Selangor: Semangko Pass, 2,700' (February); Bukit Kutu (August); Klang Gates (January); Ginting Bidai, 2,300' (September); Ulu Gombak (September). Pahang: Bentong (June).

Notes:—This race is widely spread throughout the Peninsula in submontane country, ranging up to about 3,000' in altitude, above which its place is taken by *P. montanus*. As is the case with many other species originally described from Southern Tenasserim by Hume it is evident that it has no

claim whatever to specific rank, but is only a slightly larger form of the Sumatran and Bornean *P. xanthogaster*. Raffles with the female slightly more brightly coloured. None of the Peninsula examples are as large as those of Hume's series from Tenasserim, though northern specimens are decidedly larger than those from Johore and from authentic specimens of *P. xanthogaster* from Sumatra and Borneo with which I have compared them. The presence or absence of red on the outer web of the fourth primary of the male, seems to be of little diagnostic importance though it is more frequently absent in southern than in northern peninsular specimens. It is present in three out of four Sumatran specimens and in both the Bornean skins which I have examined.

***Pericrocotus xanthogaster* subsp. *xanthogaster*.**

Raffles' Minivet.

Lanius xanthogaster, *Raffles, Trans. Linn. Soc.* iii, p. 309 (1822). *Pericrocotus xanthogaster*, *Sharpe, Stray Feath.* iv, p. 208 (1876); *Tweedd. Ibis*, 1877 p. 315; *Sharpe, Cat. Birds Brit. Mus.* iv, p. 74 (1879); *Nicholson, Ibis*, 1883, p. 46 *Buttikofer, Notes Levd. Mus.* ix, p. 46 (1887). *Pericrocotus ardens*, *Bp. Conspectus* i, p. 357 (1851); *Hume, Stray Feath.* v, p. 196 (1877).

Pericrocotus subardens, *Hume, Stray Feath.* v, p. 196.

Adult male.—Practically indistinguishable from that of *P. xanthogaster flammifer* but slightly smaller in size.

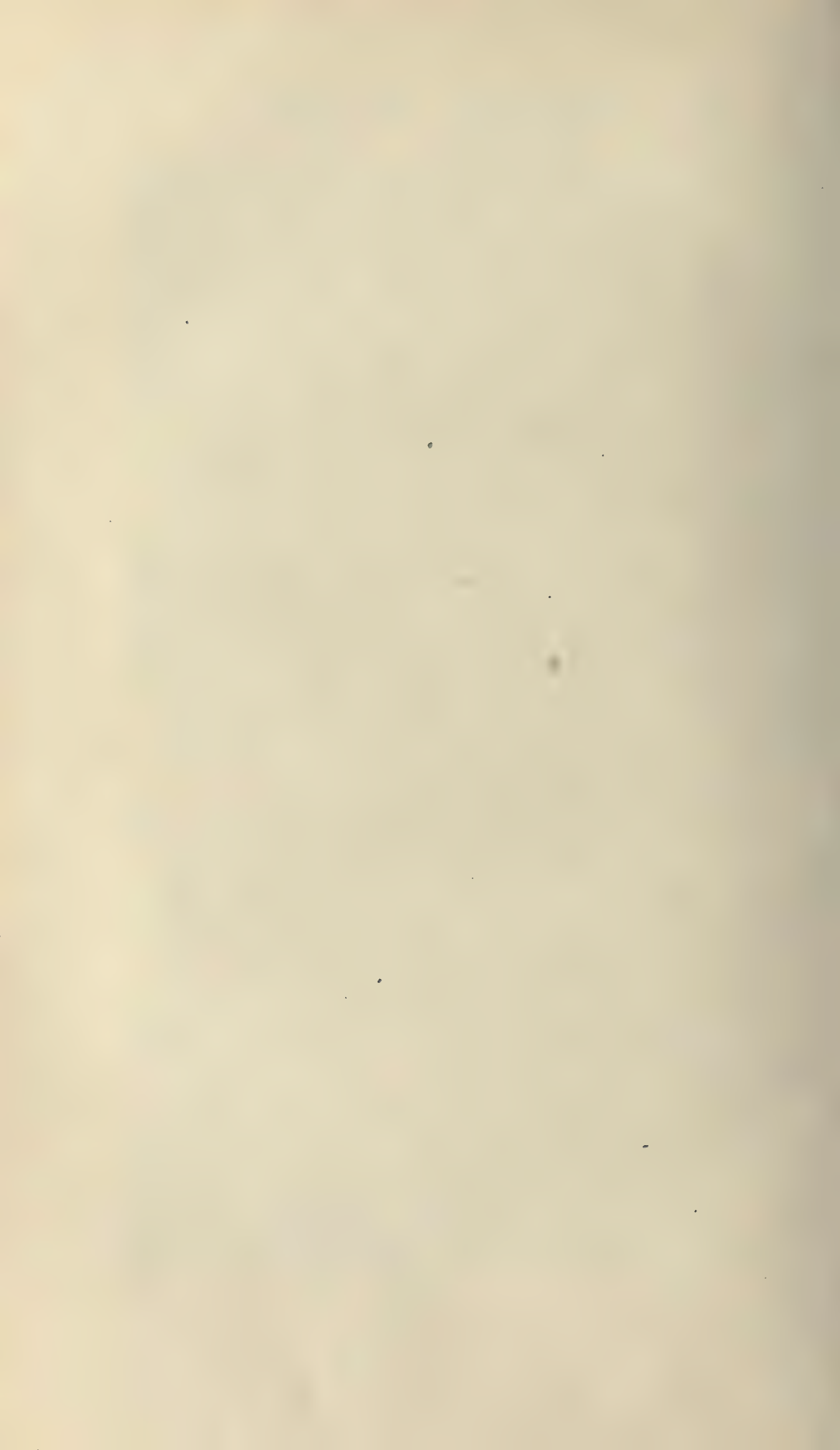
Adult female.—Yellow on the forehead, more restricted, and tint of the lower back and rump and under surface more suffused with greenish olive.

Dimensions.—Adult male.—Total length, 6.4; wing, 3.15; tail, 3.1 in.

Adult female.—Total length, 6.7; wing, 3.08; tail, 3.1.

Localities in the Peninsula.—Negri Sembilan: Bukit Tangga (January, July). Pahang: Krau River (November). North Johore: Segamat, Padang Tuan (February). Malacca (Brit. Mus.). South Johore (*Hume Coll.*). Singapore (*Brit. Mus.*).

Remarks.—Owing to the comparatively small series available, especially of females, the identification of the bird from the southern third of the Malay Peninsula with that from Sumatra and Borneo is not altogether certain, though it is probably correct. South of the termination of the main range in Southern Selangor the bird is decidedly rare and but few specimens are on record. In Sumatra and Borneo it appears to be fairly common.



VI. TWO NEW PLANTS FROM GUNONG TAMPIN, NEGRI SEMBILAN.

By H. N. RIDLEY, C.M.G., F.R.S., *late Director of Gardens, S.S.*

DIPLOSPORA LASIANTHA, *sp. nov.*

A shrub, branches slender, brown-velvety; leaves lanceolate to elliptic lanceolate, slightly oblique, shortly cuspidate, shortly narrowed at the base, 14 cm. long, 3.5 cm. wide; above, subglabrous, not polished except the midrib and margins, which are hairy; beneath dotted over with hairs, nerves 8 pairs, slender, ascending, midrib hairy; petiole, 5 mm. hairy. Stipules lanceolate acuminate, velvety hairy. Flowers, 3-4 sessile, axillary. Calyx velvety with short obtuse lobes. Corolla 4 mm. long, tube short, lobes four ovate, acute, all hairy except the glabrous inner face of the lobes. Stamens exsert in a cone from the mouth of the tube, hairy.

A very distinct plant in its small leaves and hairy corolla.

ARGOSTEMMA TENUE, *sp. nov.*

A succulent herb with a basal tuber, stem 6-10 cm. long, slender; leaves subterminal 3, one lanceolate long acuminate, base cuneate, thin, glabrous, pale beneath, 14 cm. long, 2.5 cm. wide, very shortly petioled, nerves very fine, ten; two below it, small unequal lanceolate obtuse, 8-10 mm. by .2 to 4 mm. Panicle lax, base, 2.5 cm. wide, bracts short foliaceous 4 mm. long. Branches slender. Calyx short campanulate, with rather large 4-lobed limb. Corolla lobes 4, lanceolate acuminate 4 mm. long, very narrow.

Stamens very narrow, forming a narrow elongate cone as long as the corolla, long beaked.

Near *A. verticillatum*, but the leaves are reduced to one long and two very small ones, and the inflorescence and flowers are very much smaller.

VII. ON TWO SNAKES NEW TO THE FAUNA OF THE MALAY PENINSULA.

By

C. BODEN KLOSS, F.Z.S.

Since the publication of Mr. G. A. Boulenger's volume on Reptilia and Batrachia in the "Vertebrate Fauna of the Malay Peninsula" (1912) a specimen of *Tropidonotus conspicillatus*, Günther, hitherto only known from Borneo (where it is fairly common), the Natuna Islands, and Singkep Island near the east coast of Sumatra and about 100 miles south of Singapore, has been obtained at Genting Sempah, Selangor-Pahang Boundary, 2,000 ft.

This snake may be indicated as follows in the "Synopsis of the Species" of the Malay Peninsula given in the above mentioned work (p. 123).

- I. Posterior maxillary teeth not abruptly enlarged. Internasals broadly truncate in front, nostrils lateral in a single nasal, 3 labials entering the eye, a single anterior temporal. *T. conspicillatus*.

The following is a description of the specimen obtained—
Eye moderate; nostril in a semi-divided nasal; rostral twice as broad as deep, scarcely visible from above; internasals as long as broad or a little longer, broadly truncate in front, shorter than the prae-frontals; frontal once and a half as long as broad, longer than its distance from the end of the snout, shorter than the parietals; loreal deeper than long; one prae- and three post-oculars; temporals 2+1; eight upper labials, third, fourth and fifth entering the eye; four lower labials in contact with the anterior chin shields which are shorter than the posterior.

Scales in 19 rows, all keeled except the outer row. Ventrals 144; anal divided; sub-candals 50.

Above brown, paler anteriorly with a blackish network containing reddish-brown areas of yellow-edged scales which become posteriorly two rows of small yellow spots.

Head olive-brown; nape blackish; a streak along the upper lip, others behind the eye and on the occiput and a patch on the side of the neck pale pink.

Below pinkish-red, the throat and sub-candal scales spotted blackish.

Snout to vent 282 mm, tail 68 mm.

An example of *Tropidonotus saravakensis*, Günther, hitherto regarded as confined to Borneo, was collected on Mount Menuang Gasing, Selangor-Pahang Boundary at a height of 3-4000 ft.

Its place in the Synopsis of the Species, already referred to, comes under

- II. 2 or 3 last maxillary teeth abruptly enlarged, 3 labials entering the eye ...
 Scales in 17 rows ... *T. saravakensis*.
 Scales in 19 rows ... All the other species of section II known from the Peninsula.

The description of the specimen is as follows:—

Head distinct from neck; eye large; nostril in a semi-divided nasal; rostral broader than deep, scarcely visible from above; inter-nasals truncate in front, as long as broad, a little shorter than the prae-frontals; frontal once and a half as long as broad, longer than its distance from the end of the snout, shorter than the parietals; loreal deeper than long; one prae- and three post-oculars; temporals 2+3; eight upper labials, third, fourth, and fifth entering the eye; five lower labials in contact with the anterior chin shields which are shorter than the posterior.

Scales in 17 rows, all keeled. Ventrals 146; anal divided; sub-candals 45, tail imperfect. (The sub-candals are known to vary from 52 to 89).

Above olive-brown, paler anteriorly with a series of interrupted blackish cross-bars or a network of blackish patches, a series of light spots on either side the median line; upper surface of head vermiculated with black; labials yellowish with black sutures; yellow of the under-surface extending on to the sides of the neck and fore-body.

Below checkered black and yellow, the black predominating posteriorly.

Snout to vent 410 mm, tail (imperfect) 97 mm.

VIII. PLANTS FROM GUNONG KERBAU, PERAK.

By H. N. RIDLEY, C.M.G. F.R.S.

The collection of plants made on Gunong Kerbau in February and March by the Dyak collectors of the Federated Malay States Museum is of considerable interest. A certain number of specimens had been previously brought from the mountain by Mohammed Ariff, the plant collector of Penang Gardens, who visited Gunong Kerbau with Mr. B. BARNARD a few years ago. Of the species then obtained a number were re-collected by the present party, but the bulk of the collection forms an important addition to our knowledge of the flora of this mountain.

Two of the most interesting additions to our flora were *Eurya trichocarpa* Korth., and *Carex Walkeri* Arn., both plants occurring in India and the Malay islands and not previously known from the peninsula. There are 25 new species in the Collection, of which the most important are a *Vanilla* very unlike any of the few Oriental species of this genus and more resembling the South American species, and a handsome new *Gahnia*, belonging to a genus well represented in Australia but of which only 2 species were previously known from the Malay region.

Gunong Kerbau is a peak on a spur of the main peninsular range in the Kinta District of Perak, and is the second highest mountain in the Malay Peninsula, attaining a height of 7,160 feet, and being exceeded only by Gunong Tahan in Pahang.

The present collections were made in February and March, 1913, and cover the whole of the mountain to the extreme summit.

The Birds and Mammals obtained have already been listed in a previous number of this Journal (*Journ. Federated Malay States Mus.*, v, pp. 23-27, 1914).

[The present botanical collection, like the zoological one, contains several species that are also common on Gunong Tahan, though; as might be expected, several of the most characteristic plants of that mountain are not represented. H. C. ROBINSON.]

ANONACEAE.

1. *Polyalthia pulchra*, King. At 4,200 feet.
2. *Melodorum manubriatum*, Hook. f. At 3,500 feet elevation.

MENISPERMACEAE.

3. *Cyclea laxiflora*, Miers. In fruit. At 4,000 feet.

POLYGALACEAE.

4. *Polygala venenosa*, Bl. At 4,500 feet.
5. *Polygala monticola*, Ridl. At 6,000 feet.
6. *Epirhizanthus aphylla*, Griff. At 3,500 feet.

VIOLACEAE.

7. *Viola serpens*, Wall. At 4,000 feet.

TERNSTROEMACEAE.

8. *Anneslea crassipes*, Hook. fil. At 4,500 feet.
9. *Gordonia imbricata*, King. At 4,500 to 5,500 feet.
10. *Eurya trichocarpa*, Korth. At 4,200 feet, a new record for the Peninsula, only known from India and Java.

ADINANDRA MONTANA, *sp. nov.*

Bud silky puberulous, otherwise glabrous except the flower. Leaves elliptic obtuse, narrowed at the base edge thickened, denticulate with small dark processes in the notches, coriaceous, dotted beneath with black glandular dots, nerves 11 pairs, elevated on both surfaces, midrib thick, grooved above, 7 cm. long, 4 cm. wide, petiole thick 2 mm, long. Flower solitary, axillary on a thick curved hairy peduncle 1.5 cm. long. Bract short, lanceolate, ovate, pubescent. 4 mm. long. Sepals outer pair ovate, obtuse, pubescent, inner ones glabrous, coriaceous, 5 cm. long. and as wide. Petals obovate, hairy, silky in the centre at the tip outside, otherwise glabrous.

At 6,600 feet. A single specimen. Allied to *A. macrantha* and *A. integerrima* but with the leaf very coriaceous and toothed. The flowers are not so large nor as hairy as those of *macrantha*.

12. *Ternstroemia Maclellandiana*, Ridl. At 4,000 feet.

STERCULIACEÆ.

13. *Leptonychia glabra*, Turcz. At 4,200 feet.

TILIACEÆ.

14. *Elæocarpus reticulatus*, Ridl. At 6,600 feet.

RUTACEÆ.

15. *Evodia pachyphylla*, King. The small form; at 4,500 feet.

GERANIACEÆ.

16. *Impatiens oncioides*, Ridl. At 4,500 feet.

ILICINEÆ.

17. *Ilex epiphytica*, King. 4,500 to 6,600 feet.

18. *ILEX POLYPHYLLA* *sp. nov.*

Bark black, the upper parts of the stem pale. Leaves very close set, coriaceous, elliptic to nearly obovate, margins crenate serrate, midrib prominent, nerves invisible, above polished 1.5 cm. long, 9 mm. wide, petiole 1.5 cm. long. Flowers 2 to 4 on short thick axillary peduncles. Bracts ovate, very small. Pedicels 2 mm. long. Sepals 4 ovate, obtuse, pubescent. Petals 4 ovate-oblong, obtuse glabrous. Stamens 4 shorter. Anthers elliptic. Pistillode semiglobose obscurely 4-lobed.

At 6,600 feet. This belongs to the mountain section *Vaccinifoliae* but differs from all other species in the form of the foliage.

18. *ILEX GRANDIFLORA* *sp. nov.*

Branches stout, dark when dry. Leaves alternate, coriaceous, elliptic cuspidate, bases cuneate, nerves 7 pairs inarching 3 mm. from the border, prominent beneath, reticulations conspicuous 13-14 cm. long by 4.5 cm. wide, petiole stout, rugose 1-2.5 cm. Flowers in axillary pairs or in fours on a short peduncle, pedicels 5 mm. long. Bracts minute, ovate. Sepals 4 connate rounded, ovate. Petals 4 imbricate, free nearly to base, 2 outer, oblong, obtuse, inner ones broader, 3 mm. long. Stamens 4, alternate, filaments flattened, broad, tapering upwards, anthers subcordate terminal. Ovary large ovoid, stigma large cushion-shaped, lobed, sessile.

At 4,200 feet alt.

Only female flowers seen, apparently allied to *I. sclerophylla* Hook., but the flowers larger.

OLACINEÆ.

19. *Gomphandra lanceolata* var. *angustifolia*. At 4,000 feet.

20. *Lepionurus sylvestris*, Bl. At 4,000 feet.

Leaves very narrow and flowers longer stalked than usual.

SIMARUBEÆ.

21. *Eurycoma apiculata*, Benn. At 2,000 to 4,000 feet.

CELASTRINEÆ.

22. *Euonymus javanicus*, Bl. At 2,000 feet.

A form with much longer peduncles than usual and larger flowers.

LEGUMINOSÆ.

23. *Bauhinia Scortechinii*, King. At 4,500 to 5,500 feet alt.

SAXIFRAGACEÆ.

24. *Polyosma ilicifolia*, Bl. At 4,500 feet.
 25. *Polyosma coriacea*, King. At 4,500 to 5,000 feet.

MELASTOMACEÆ.

26. *Melastoma malabathricum*, var. *normale*, Don.
 The form commonly found at high altitudes.
 27. *Oxyspora stellulata*, King. At 4,500 to 6,000 feet.
 28. *Allomorphia exigua*, Bl. At 4,000 feet.

29. ALLOMORPHIA HIRTICALYX *sp. nov.*

A shrub. Stems rough brown, glabrous, internodes 2.5 cm. long. Leaves elliptic cuspidate, base rounded, glabrous, coriaceous 14 cm. long, 6.5 cm. wide, main nerves very prominent beneath, petiole 3 mm. long. Panicle terminal, lax, spreading 6-7 cm. long, base nude, scurfy for 3 mm. lowest branches 8 cm. long, cyme branches 4 cm. or less, all covered with glandular hairs. Bracts very small, linear, acuminate.

Calyx goblet-shaped, narrowed to the pedicel 5 cm. long, covered with glandular hairs, lobes short, blunt, ovate. Petals small, rounded 3 mm. long, obovate, retuse. Stamens all similar and very nearly equal, filaments slender, glabrous, anthers horn-shaped, lanceolate, 3 mm. long. Style slightly dilated upwards, filiform. Fruit ellipsoid, narrowed at the base, 5 mm. long, dehiscing from the top, eventually glabrous.

At 4,500 to 5,000 feet altitude. Also collected at the same locality by Mohammed Aniff.

30. *Sonerila trachyantha*, King & Stapf. At 4,500 feet.
 31. *Sonerila rudis*, King & Stapf. At 4,000-4,500 feet.
 32. *Sonerila tenuifolia*, Bl. At 4,000 feet.
 33. *Medinilla Clarkei*, King. At 4,500 feet.
 34. *Astronia smilacifolia*, Tri. At 2,000 feet.

MYRTACEÆ.

35. *Boeckia frutescens*, L. At 4,500 feet.
 36. *Leptospermum flavescens*, Sm. 6,000 to 6,600 feet.

37. *Rhodamnia trinervia* var. *uniflora*. At 5,500 feet elevation. The same form as on Mt. Ophir and Gunong Tahan?

38. *Rhodamnia trinervia* var. *sub-triflora*. At 4,500 feet.

39. *Eugenia Stapfiana*, King. At 4,500 feet.

40. E. (JAMBOSA) *JUGALIS* sp. nov.

Branches grey. Leaves very coriaceous, elliptic, blunt or rounded, narrowed at the base or obovate, drying pale, dotted black underneath, nerves about 8 pairs faint on both surfaces, especially beneath, secondaries nearly as conspicuous, midrib grooved above, elevate beneath, reticulations fine and prominent, 5 cm. long, 3 cm. wide, petiole thick channelled .5 mm. Corymb shorter than the leaves terminal 5 cm. long, pedicels 1 cm. long. Calyx obconic 7 mm. long. Petals suborbicular 5 mm. long, soon caducous separately. Stamens very numerous 1.5 to 2 cm. long, anthers small. Style longer.

From 4,000 to 6,000 feet elevation. In one specimen the leaves are larger, 8 cm. long by 5 cm. wide.

BEGONIACEAE.

41. *Begonia praeclara*, King. At 4,000-4,200 feet.

42. *B. venusta*, King. At 4,500 feet.

SAMYDACEAE.

43. *Casearia esculenta*, Roxb. At 4,000 feet.

ARALIACEAE.

44. *Brassaiopsis palmata*, King. At 4,500 feet.

45. *Heptapleurum subulatum*, Seem. At 2,000 feet.

RUBIACEAE.

46. *Ophiorrhiza communis*, Ridl. At 4,000 feet.

47. *Argostemma involucreatum*, Hemsl. At 4,500 feet.

48. var. *glabrum*. At 4,000 feet.

49. *Argostemma subcrassum*, King. At 4,500 feet.

50. *Urophyllum glabrum*, Roxb. At 4,200 feet.

51. *Hedyotis capitellata*, Wall. At 2,000 to 3,500 feet.

52. *Gardenia* (*Gardeniella*) *pulchella*, Ridl. At 5,000 feet.

53. *Ixora stricta*, Roxb. At 4,500 feet.

54. *J. opaca*, Br. At 5,000 feet.

55. *Psychotria sarmentosa*, Bl. At 4,000 feet.

56. *P. Birchiana*, King. At 4,000 feet.

57. *P. MEGACARPA* *sp. nov.*

A shrub. Leaves lanceolate, acuminate, acute, base narrowed to the petiole, thinly coriaceous, 14 cm. long, 3.5 cm. wide, drying red-brown, glabrous, nerves 12 pairs, fine, meeting near the edge, petiole 1.5 cm. long, rather slender. Stipules short, ring-like. Flowers not seen. Panicles few flowered lax 6 cm. long, branches few, spreading. Fruit ellipsoid, crowned with the remains of the perianth, 1 cm. long on pedicels 1 cm. long. Seeds convex on the outer side, 6-ribbed at inner surface, flat, 6 mm. wide.

At 3,500 feet.

Allied to *P. Jackii*, with very similar leaves but very much larger fruit.

58. *Psychotria condensa*, King & Gamble. At 6,600 feet.

There are two forms of this, very different in appearance, one with distant pairs of elliptic leaves, blunt tipped 3 cm. long and 2 cm. across, and the other with smaller, more lanceolate condensed leaves, 1.5 cm. long and 7 mm. wide.

59. *Lasianthus rhinocerotis*, Bl. At 4,000 feet.

60. *LAUDICULATUS* *sp. nov.*

Branches slender, covered with fine yellow appressed hairs. Leaves lanceolate, long caudate base sharply cuneate above, glabrous, shining, drying greenish, nerves obovate, 5 pairs beneath, glabrous, except the edges, long, ciliate and rounded midrib and elevated nerves all appressed, hairy, petiole slender 4 mm. long, silky. Stipules persistent, triangular, acute, silky. Cymules sessile, shorter than the petiole, few flowered. Bracts small. Calyx lobes ovate, acute, covered with silky yellow hairs. Corolla tube rather stout, lobes 4, ovate, triangular, acute; 4 mm. long, all hairy. Style long, protruding. At 4,500 feet.

Allied to *L. longicauda*, Hook. fil. of the Himalayas, but with leaves hairy on nerves and edges and sessile flowers.

COMPOSITAE.

61. *Gynura sarmentosa*, DC. At 3,000 feet elevation.

62. *Erigeron linifolius*, Willd.? At 6,000 feet.

CAMPANULACEAE.

63. *Pentaphragma Scortechinii*, King. At 4,000 feet.

VACCINIACEAE.

64. *Vaccinium viscifolium*, King & Gamble. At 4,500 feet.

Vaccinium longibracteatum, Ridl. At 5,000 to 5,500 feet elevation.

ERICACEAE.

66. *Gaultheria fragrantissima*, Wall. At 6,000 feet alt.

67. *GAULTHERIA HIRTA* *sp. nov.*

Branches flexuous, roughly hairy, with red clubbed hairs and shorter silky hair. Leaves alternate, ovate, acuminate, base rounded, red, hairy, coriaceous, paler beneath, nerves 4-5 pairs inarching within the margin, reticulations prominent, 7 cm. long, 2.5 cm. wide, petiole thick, red, hairy .4-.5 mm. long. Racemes axillary beneath, the leaf 3 cm. long, 5 to 6 flowered, hairy, pedicels .5 mm. long. Sepals 5-ovate, acutem connate at the base for half their length. 2 mm. long, hairy outside. Corolla, tube urceolate, 6 mm. long, sparingly hairy outside, the hairs rather long, lobes 5, short, lanceolate, obtuse, glabrous within. Stamens 10, filaments glabrous half the length of the corolla. Anthers elliptic, oblong with a pair of bifurcated appendages with filiform points, orange colour. Ovary rounded, flattened, silky. Style as long as the perianth tube glabrous, pink. Stigma discoid, small.

At 5,000 feet alt.

Allied to *G. leucocarpa*, Bl. but hairy.

68. *Pieris ovalifolia*, Don. At 6,000 feet alt.

69. *Rhododendron Wrayii*, King & Gamble, 5,500 to 6,600 feet.

70. *Rhododendron Malayanum*, Jack. At 4,500-feet.

71. *Rhododendron elegans*, Ridl. At 6,600 feet.

Only previously known from Gunong Tahan.

72. *Rhododendron spathulatum*, Ridl. At 6,600 feet.

First collected at this spot by Mahommed Ariff.

73. *Pernettyopsis Malayana* King. At 6,600 feet.

EPACRIDEAE.

74. *Leucopogon Malayanus*, Jack. At 4,500 feet.

MYRSINEAE.

75. *MYRSINE LANCEOLATA* *sp. nov.*

A shrub or tree with spreading branches. Leaves thinly coriaceous, lanceolate acuminate at both ends, midrib

prominent, primary nerves inconspicuous, very numerous, secondary nerves similar, reticulations fine and prominent, 12 cm. long, 2.5 cm. wide, petioles 6 mm. long, thick, rugose. Flowers not seen. Fruits on pedicels 1 mm. long, 4 or 5 together on small bosses, below the leaves. Calyx lobes ovate, acute, glandular, not ciliate. Drupe 2 mm. through globose crowned with the style, pale, reticulate with deep red glands round the style. At 5,000 feet.

Allied to *M. perakensis*, King & Gamble, but with thinner acuminate leaves.

76. *Labisia longistylis*, King & Gamble.

77. *Ardisia pachysandra*, Mez. At 4,500 feet.

78. *Ardisia theaeifolia*, King & Gamble. At 4,500 feet.

79. *Ardisia rosea*, King & Gamble. From 3,500 to 4,000 feet.

80. *Ardisia chrysophyllifolia*, King & Gamble. At 6,000 feet.

81. *Ardisia colorata*, Roxb. At 4,200 feet.

82. *EMBELIA ROTUNDIFOLIA* sp. nov.

Shrub, probably a climber. Leaves stiffly coriaceous, elliptic ovate, blunt, bases rounded, midrib grooved above, main nerves, secondaries and reticulations slender, prominent above, not or hardly visible beneath, densely black-dotted on both surfaces, 4.5 cm. wide, petiole 7 mm. long. Panicles very short, axillary, peduncles 2 mm. long, covered with ovate bracts, with one or two short branches, similarly bracteate, pedicels 3 mm. long. Sepals 4 connate at base, ovate, obtuse, gland-dotted. Petals free, pubescent, elliptic, somewhat clawed, glandular at the tip, 1.5 mm. long. Stamens 4, adnate to the petals near the base. Anthers ovate, notched at the base eglandular. Ovary ovoid, style cylindric, short, red, glabrous.

At 5,000 feet alt.

Curious from its rounded, almost orbicular stiff leaves and the very conspicuous glands on the sepals and petals.

APOCYNACEÆ.

83. *Chilocarpus costatus*, Miq. At 2,000 feet elevation.

ASCLEPIADACEÆ.

84. *Dischidia tubuliflora*, King & Gamble.

85. *Dischidia monticola*, King & Gamble. At 4,200 feet.

This appears to be a shrubby plant, and not a twiner like most species.

86. *Pentasacme caudata*, Wall. At 3,500 feet alt.

LOGANIACEÆ.

87. *Gaertnera acuminata*. Benth.

88. *G. Koenigii* var. *oxyphylla*.

This is so clearly distinct from *G. Koenigii*, Wight of Ceylon, that it is preferable to keep it a distinct species.

89. *GAERTNERA CAUDATE* *sp. nov.*

Stem slender, pale, corky, barked below. Leaves patent, lanceolate, caudate, base long-narrowed, acuminate, thinly coriaceous, nerves 7 pairs, reticulations visible, very fine, midrib prominent 11 cm. long, 2.5 cm. wide, glabrous, petiole 1 cm. long. Stipules tubular with a few setaceous points, 5 mm. long, uppermost shorter.

Panicle terminal lax 3.5 cm. long, with one or two branches 1 cm. long at the base, scurfy. Bracts very small, lanceolate acuminate. Pedicels 2 mm. long. Calyx broadly cup-shaped with 5 setaceous points, 2 mm. long, glabrous. Corolla funnel-shaped, base cylindric, minutely scurfy 1.5 cm. long, lobes lanceolate, shorter than the tube, inside glabrous except for long white hairs surrounding the mouth of the tube. Anthers linear in the mouth of the corolla, included.

At 4,500 feet elevation.

GENTIANEÆ.

90. *Crawfurdia Blumei*, Don. At 6,600 feet.

SYMPLOCACEÆ.

91. *SYMPLOCOS* (*CORDYLOBLASTE*) *CRENULATA* *sp. nov.*

A shrub. Leaves oblanceolate or obovate, obtuse, crenate at the upper part with a short tooth in each crenulation, base narrowed, coriaceous, glabrous, nerves 5 pairs with the reticulations conspicuous on both surfaces, midrib stout, 4.5 to 5 cm. long, 2 cm. wide, petiole 5 mm. long. Flowers numerous, solitary, axillary, pendulous, on short (1 mm.) pedicels, silky, with 2 small ovate lanceolate silky bracts to each flower. Calyx campanulate, short, lobes 5, subacute, white, silky. Corolla tube stout, lobed nearly to the base, but adnate except the apices and margins to the staminal tube, 1 cm. long, lobes broad, obtuse, appressed hairy on two rows and towards apex, margins and inner face glabrous. Staminal tube hairy within, adnate to the corolla for most of its length lobes 15, oblong truncate, tipped by a short, free filament

Anthers small, about 40. Ovary cylindric, silky, hairy, little broader than the glabrous, stout style. Stigma pulvinate.

At 6,600 feet.

Mohamed Aniff obtained another species on Gunong Kerbau, *Symplocos obovata*, Ridl. This differs from that in the solitary flowers and crenulate leaves.

GESNERACEÆ.

- 92. *Aeschynanthus perakensis*, Ridl. At 4,000 feet.
- 93. „ *longicalyx*, Ridl. At 5,500 feet.
- 94. „ *Lobbiana*, Hook. fil. At 2,000 feet.
- 95. „ *obovata*, Clarke. At 2,000 feet.
- 96. *Agalmys staminea*, Bl. At 2,000 feet.
- 97. *Didissandra filicina*, Ridl. At 4,000 feet.

98. DIDYMOCARPUS (ELATÆ) ROBUSTA sp. nov.

Very tall and woody, over 60 cm. tall, stem stout 4 mm. through woolly, internodes 7 cm. long. Leaves in distinct whorls of 2 or more, ovate, thick, densely red, woolly, on both sides, equal, subacute, edges shortly bluntly toothed, base rounded, nearly aequilateral, 4.5 cm. long, 2 cm. wide; nerves 10 pairs, elevated beneath, wholly .5 mm. Cymes several from the upper axils, peduncles 16 cm. long, hairy. Bracts 2, ovate shaped, acute glabrous 5 mm. long. Calyx glabrous funnel, 1 cm. long with short distinct cusps. Corolla yellow, 1.5 cm. long, tube rather narrow at the base; gradually dilate upwards, 1 cm. across the mouth, lobes broadly rounded. Stamens 2, filaments adnate to the tube half way down included. Pistil puberulous. Style rather long, stigma spoon-shaped. Capsule cylindric 3.5-4 cm. long, glabrous, cuspidate. From 6,000 to 6,600 feet alt.

Differs from other species of the section in the thicker leaves in equal pairs or whorls, smaller and more woolly, the much longer peduncles, larger calyx and smaller corolla.

99. DIDYMOCARPUS SULPHUREA var. GRANDIFLORA, var. nov.

Differs in the calyx lobes being broadly lanceolate, acuminate, and the corolla being 3 cm. long and 1.4 cm. across. At 6,000 feet alt.

100. *Didymocarpus quinque-vulnera*, Ridl. 4,200 to 5,500 feet alt.

101. *Didymocarpus malayana*, Hook. fil. At 4,500 feet.

A variety with a white feather in the centre of the leaf.

102. *Didymocarpus hispida*, Ridley. At 6,600 feet.

103. *DIDYMOCARPUS MODESTA*, *sp. nov.*

Stem slender or moderately stout; woody, unbranched, 14 cm. tall, appressed, hairy. Leaves opposite in equal pairs, lanceolate, acuminate at both ends; entire, thin, glabrous except the edges and nerves beneath, which are hairy, nerves 4 pairs ascending, 7 cm. long, 2.2 cm. wide, petiole .5 mm. long. Flowers solitary, axillary, usually in the uppermost axil, peduncle 5.5 cm. long, hairy. Bracts narrow, setaceous, hairy, short. Calyx-lobes setaceous, deep purple, 2 mm. long. Corolla tube narrowed at the base, gradually dilated upwards, curved, sparingly hairy, lobes oblong, rounded half as long. Stamens 2, included filaments from near the base. From 3,000 to 5,500 feet elevation, var. *b. minor*. Leaves 5.5 cm. long, 1.5 cm. wide, peduncle 7 mm., much shorter than the leaves. Corolla 1 cm. long. At 3,500 feet elevation.

Perhaps nearest to *D. parviflora*, Ridl., but unbranched, with larger leaves and a curved corolla, which appears to be white or yellowish.

104. *Cyrtandra decurrens*, var. *Wallichii*. At 4,000 feet.

105. *Cyrtandra pilosa*, Bl. At 4,000 feet.

ACANTHACEAE.

106. *JUSTICIA INCONSPICUA* *sp. nov.*

Weak branching, glabrous herb. Leaves alternate, thin, ovate, lanceolate, acuminate, obtuse, base long, narrowed, usually inaequilaterally, raphides short but very abundant on both sides. 12.5 cm. long, 4.5 cm. wide or less, midrib scurfy beneath, petiole 1 cm. long. Raceme terminal 1 cm. long, few flowered, pedicel 2 mm. long. Bract narrow, lanceolate, acute erect, appressed minutely mucronate with a broad, flat elevated midrib, .5 mm. long, .1 mm. wide, as long as the corolla tube. Corolla 1.2 cm. long, tube thick, upper lobe narrowed, lanceolate, obtuse, lower with three short, blunt lobes, pubescent outside. Stamens 2, filaments stout 8 mm. long. Anthers 2, cells unequal, the lower one with a long conic point, as long as the cell. Style glabrous.

Alt. 3,600 to 4,000 feet. The flower appears to have been yellow with purple veins on the palate. The bracts are more or less tinted with purple. Allied to *J. flaccida*, Ridl. but with a much shorter spike and bracts not as long as the flowers.

LABIATAE.

107. *Gomphostemma crinitum*, Wall. At 4,000 feet.

VERBENACEAE.

108. *Vitex gamosepala*, Griff. At 4,500 feet.

NEPENTHACEAE.

109. *Nepenthes Macfarlanei*, Hemsl. 5—6,000 feet.

BALANOPHORACEAE.

110. *Balanophora gigantea*, Wall. At 4,000 feet.

PIPERACEAE.

111. *Piper magnibaccum*, DC. At 4,000 feet.

LORANTHACEAE.

112. *Loranthus pulcher*, DC. At 4,500 feet.

LAURINEAE.

113. CINNAMOMUM PARVIFOLIUM, *sp. nov.*

Tree or shrub with dense branches, bark dark, blackish brown. Leaves coriaceous, glabrous, ovate, acuminate, base rounded, subopposite or alternate, three nerves conspicuous, transverse, nervules fine, hardly visible, above glabrous, shining, 5 cm. long, 3 cm. wide, petiole 5 mm. long, Cymes 1.5 long, axillary, peduncle slender, 1 cm. long, pedicels 3 subumbellate, 5 mm. long.

Flowers 2 mm. long. Sepals 3 elliptic, obtuse. Petals, ovate, obtuse, all pubescent, silky within. Stamens 4-celled, outer row 6, filaments linear, glabrous, anther oblong, inner 3, with 2 large glands on the hairy filaments.

Staminodes 3 conic on short filaments. Ovary flask-shaped, style short.

At 4,200 feet. Remarkable for its little, stiff, ovate leaves.

114. *Alseodaphne oleifolia*, Gamble.

URTICACEAE.

115. PSEUDOSTREBLUS CAUDATUS *sp. nov.*

Glabrous, unarmed, probably a shrub, branches slender, bark black. Leaves alternate, elliptic, caudate, tip with a long, blunt point, base shortly cuneate, thinly coriaceous, nerve, horizontal, primaries about 11 pairs inarching within the margin, secondaries nearly as prominent, reticulations conspicuous beneath. Male flowers on short pedicels 2 mm. long-axillary bracts ovate, very small. Pedicels 5-6 mm. long, slender flowers crowded at the tip, 4 or 5 to each spike, sessile. Sepals 4 or 5 ovate, acute. Stamens 4-5 inflexed in bud, filaments twice as long as the sepals, flat, 2 mm. long. Anthers elliptic, rounded, Pistillode oblong, truncate. At 4,500 feet.

I am a little dubious as to the genus of this plant as I have not seen the female. I refer it to *Pseudostreblus* rather than *Taxotrophis* as it is quite unarmed and has, occasionally at least, 5 sepals and stamens.

116. *Hullettia dumosa*, King, at 4,000 feet.

117. *Ficus chartacea*, Wall. At 4,200 feet.

118. *Ficus diversifolia*, Bl. At 4,000 feet.

One form has elliptic leaves, acuminate at both ends, 11 cm. long and 2 cm. wide, a curious form.

CUPULIFERAE.

119. *Pasania grandifrons*, Gamble. 5,000 to 6,000 feet,

GNETACEAE.

120. *Gnetum Brunonianum*, Griff, at 5,000 feet.

ORCHIDEAE.

121. *Dendrobium longipes*, Hook. fil. At 6,000 to 6,600 feet.

122. *Trichotomia pyrrhotricha*, Ridl. At 3,400 to 4,500.

123. *Eria Scortechinii*, Hook. fil. At 5,500 feet.

124. *ERIA (AERIDOSTACHYA) CRASSIFOLIA* *sp. nov.*

Rhizome stout, woody, with many slender, wiry branched roots. Pseudobulbs approximate, ascending, cylindric, 5 cm. long, 1.5 cm. through, covered with brown, coriaceous, truncate sheaths, or the sheathing bases of leaves. Leaves very coriaceous, lanceolate, obtuse, or subacute, narrowed gradually to the base, 13-18 cm. long, 1.5 cm. wide or less, nerves invisible, under surface quite smooth. Scapes axillary, with a large pale papery sheathing, bract 5 cm. long, 1 cm. wide at the base. Peduncle 13 to 19 cm. long; brown, woolly. Raceme as long, dense, ovary, pedicels, rachis and outside of sepals brown tomentose. Bracts minute, acute. Pedicel and ovary 1 cm. long. Upper sepal oblong, tip rounded, lateral sepals broadly triangular, ovate, 2 mm. long, mentum cylindric, conic, obtuse 2 mm. long. Petals glabrous, linear, oblong, blunt, incurved over the column. Inner face of sepals and petals apparently bright yellow. Lip short, base very shortly narrowed, blade oblong, faintly 3-lobed apex broad, rounded, truncate, glabrous, base slightly thickened. Column stout, broad (apparently purple) face flat, a V-shaped ridge at the base, margin of clinandrium distinctly elevated all round but not tall.

From 4,000 to 6,000 feet elevation.

This resembles *E. crassipes*, Ridl. to some extent, but the petals are not lanceolate and the leaves are wider, the pseudo bulbs are different. The mentum is shorter than in *E. aeridostachya*, Lindl., *E. lorifolia*, Ridl. etc.

125. *Phreatia nana*, Hook. fil.

126. *Phaius callosus*, Lindl. At 4,000 to 5,000 feet.

127. *Arundina speciosa*, Bl.

128. *Nephelabhyllum pulchrum*, Bl. At 4,500 feet.

129. *Spathoglottis plicata*, Lindl. At 2,000 feet.

130. *Spathoglottis aurea*, Lindl. Small form. At 4,500 to 6,000 feet.

131. *Dilochia Cantleyi*, Hook. fil. At 6,000 feet.

132. *Platyclinis Kingii*, Hook. fil. At 6,600 feet.

133. *PLATYCLINIS PULCHELLA*, *sp. nov.*

Pseudobulbs crowded on a rhizome 6 inches long, ovoid, conic, rugose 1 cm. long. Leaf coriaceous, lanceolate, obtuse, narrowed to base, 2—3.5 cm. long, 5 mm. wide, keel prominent beneath. Scape 9-10 cm. long, base (3-4 cm.) nude. Flowers crowded, numerous. Bracts narrow, lanceolate 2 mm. long, longer than the pedicel and ovary. Sepals lanceolate, acute, 7 mm. long, 2 mm. wide at the base. Petals a little shorter, the two outer nerves curve in and join the median about the middle of the sepals and petals. Lip pandurate, basal wings rounded, denticulate with short, acute, free points, middle ovate, acute, keels 2 from the base brown, incurving, ending on the base of the midlobe, median nerve straight elevate running to end of midlobe. Column slender, curved, stielidia linear, acuminate from near the base, winged to the base, nearly as long as the column. Hood of clinandrium ovate, rounded, entire.

From 5,500 to 6,600 feet. The flowers apparently yellow or green, with the outer raised veins brown. The lip has much the shape of that of *P. latifolia*.

134. *PLATYCLINIS CARNOSA* *sp. nov.*

Rhizome long, woody, pseudo-bulbs conic, 2 cm. long, 5 mm. through at base, 1-5 cm. apart. Leaves coriaceous, elliptic, lanceolate, obtuse, base slightly narrowed, 6-5 cm. long, 6 mm. wide, nerves 6-7, petiole stiff, 1 cm. long. Scape nodding 14 cm. long, basal half nude. Bracts lanceolate, obtuse, longer than the pedicel and ovary 3 mm. long. Flowers numerous, fleshy. Sepals broadly lanceolate, obtuse. Petals shorter, 5 mm. long, 2 mm. wide, nerves 3, incurving into the median at the tip. Lip fleshy, side-lobes minutely

denticulate, free points distinct, lanceolate, acuminate, curved outwards, ridges elevate 2, short, dark-coloured, rising from the base to near the middle, midlobe ovate, acuminate, acute denticulate. Column short, thick, straight, apex hooded, hood tall, oblong toothed. Stelidia short from near the stigma, broad, acuminate, upcurved.

At 6,600 feet. Remarkable for its fleshy flowers.

135. *PLATYCLINIS GRAMINEA* sp. nov.

Rhizome woody, stout, 4 mm. through, pseudo-bulbs elongate conic, cylindric, 3 cm. long, 4 mm. through at the base. Leaf long, lanceolate, acuminate, long-narrowed to the base, thin, grassy, membranaceous, subacute, mucronulate, nerves 2 pairs, fine; midrib conspicuous, 16 cm. long, 1.5 cm. wide; petiole 7 mm. long. Scape enclosed with the petiole in a narrow tubular sheath at the base, 6.5 cm. long, slender, 30 cm. long, lower half nude. Flowers numerous, small. Bracts lanceolate, acuminate, much longer than the ovary and pedicel, 2 mm. long. Sepals lanceolate acuminate, narrow, acute, 1-nerved, 4 mm. long, 1 mm. across, at base. Petals $\frac{3}{4}$ as long. Lip very narrow; nearly entire, lanceolate, acute with 2 thin raised keels at the base, side lobes indistinctly marked; free points minute. Column straight. Stelidia from near the stigma broad-based, apices, acuminate, acute, shorter than the column. Clinandrium, hood ovate 2-3, toothed at the tip. Anther ovoid, pyriform-acute.

At 5,500 and 6,000 feet.

Allied to *P. linearis*, Ridl. but smaller, with a different lip.

136. *COELOGYNE RADICOSUS* sp. nov.

Rhizome stout, woody, branched, with numerous long, thick, wiry roots, 4 mm. in diameter. Pseudo-bulbs narrow, cylindric, 6 cm. long, 4 mm. through when dry, 2 cm. apart. Leaves 2, coriaceous, lanceolate, acute, narrowed to a stout petiole, 9 cm. long, 2 cm. wide, 5 nerved, petiole 1 cm. long. Scape from between the leaves, 11-13 cm. long, slender, erect, peduncle about as long as the raceme, flattened; slightly ancipitous. Raceme flexuous, few flowered. Bracts caducous, the lower one lanceolate, acuminate 1.5 cm. long. Pedicel 3 mm. long. Sepals linear, oblong, obtuse, 12, mm. long, 2 mm. wide, 6-nerved. Petals as long, linear, filiform, very narrow. Lip shorter, lateral lobes curved, apices lanceolate, as long as the column; midlobe longer, flabellate, rounded, 2 semi-elliptic, thin, flat keels on the disc. Column rather short, hardly curved; margin of clinandrium large, ovate, obtuse, entire. Rostellum large, rounded.

At 6,600 feet. A single specimen.

Allied to *C. cuprea*, Wendl., but with much smaller flowers and different keels.

- 137. *Coelogyne carnea*, Hook. fil.
- 138. *Dendrochilum album*, Ridl. At 6,000 feet.
- 139. *Dendrochilum angustifolium*, Ridl. At 6,000 feet.
- 140. *Saccolabium bigibbum*, Lindt. At 4,200 feet.
- 141. *Podochilus cornutus*, Schlechter. At 2,000 feet.
- 142. *Podochilus unciferus*, Hook. fil. At 2,300 feet.
- 143. *Aphyllorchis pallida*, Bl. At 3,500 feet.

144. *VANILLA MONTANA* *sp. nov.*

A long, stout climber. Leaves fleshy, lanceolate, acuminate, obtuse at the tip; narrowed to a rather broad base, 12-14 cm. long, 3.5 cm. across. Racemes axillary, 1 cm. long, few flowered. Bracts orbicular, rounded, 2 mm. long. Sepals oblanceolate, sub-spathulate acute; nerves 7, undulate, 5 cm. long .7 mm. wide. Petals similar but smaller. Lip 4.2 cm. long, base narrow, adnate to the column; limb long trumpet-shaped, 2 cm. across at the mouth, margin in the centre with filiform processes. Callus in the mouth, broad, fan-shaped, pectinate with linear acute teeth. Column 4 cm. long. Clinandrium margin tall, hooded, bilobed, obtuse, rounded. Rostellum broad, oblong, truncate, entire. Fruit (pressed) oblong, broad, 8 cm. long .2 cm. across.

Perak, Gunong Kerbau 4,400 to 4,500 feet.

SCITAMINEAE.

- 145. *Globba pendula*, Roxb. At 2,000 feet. The same plant as grows at the Penang waterfall.
- 146. *Globba cernua*, Bak. At 4,000 feet.
- 147. *Globba violacea*, Ridl. At 4,000 feet.
- 148. *Globba perakensis*, Ridl., var. with more elongate panicle.
- 149. *Camptandra ovata*, Ridl. At 4,200 feet.
- 150. *Conamomum citrinum*, Ridl. At 4,000 feet.
- 151. *Alpinia aurantiaca*, var. *hirtior*. Much more hairy than the type, the petals quite silky, hairy outside.

APOSTASIACEAE.

- 152. *Abostasia Wallichii*, Lindl. At 4,000 feet.

AMARYLLIDAEAE.

153. *Curculigo latifolia*, Dryand. At 4,000 feet.
A form with long, narrow leaves.

BURMANNIACEAE.

154. *Burmannia longifolia*, Becc. At 6,000 feet.

LILIACEAE.

155. *Protolirion paradoxum*, Ridl. At 6,600 feet.
"Chinduai" of the Sakais.
156. *Peliosanthes stellata*, Andr. At 4,000 feet.
157. *Tupistra grandis*, Ridl. At 4,500 feet.
158. *Dracaena elliptica*, Thunb. At 4,200 feet.
159. *Dracaena robusta* Ridl? In fruit only.
160. *Rhuacophila javanica*, Bl. At 4,500 to 5,000 feet.

TRIURIDAEAE.

161. *Sciaphila affinis*, Becc. At 3,500 feet.

FLAGELLARIEAE.

162. *Joinvillea Malayana*, Ridl. At 4,000 feet.

PALMAE.

163. *Areca pumila*, Bl. At 4,000 feet.
164. *Penanga Scortechinii*, Becc. At 3,500 to 4,000 feet.
165. *Penanga subintegra*, Ridl. At 3,500 feet.
166. *Iguanura polymorpha*, Becc. At 4,200 feet.
167. *Iguanura Wallichiana*, Hook. fil. At 3,000 to 4,000 feet.
168. *Licuala Kingiana*, Becc. At 4,000 feet.

169. *CALAMUS PACIFICUS* sp. nov.

Almost entirely unarmed. Leaf-sheaths with a few flattened, light-brown grey-tipped thorns 4 mm. long; leaf-blade quite unarmed, 105? cm. long; petiole subterete, smooth .5 cm. through, 100? cm. long; leaflets linear, acuminate with a long point, smooth, 3-nerved, two side nerves faint, glabrous except for a few black bristles at the tip. 22 cm. long, 1.4 cm. wide. Spadix slender, 98 cm. long, base (32 cm.) nude except for two narrow, flat spathes with lanceolate points, entirely

unarmed; branches 4, about 15 cm. long with 8-13; flower-spikes slender, spreading, 5 cm. long. Spathels 1 cm. longer, less tubular with an acuminate limb. Spathellules ovate, cup-shaped with a long point, ribbed. Bracts ovate, short. Calyx wide, cup-shaped, obscurely 3-lobed with obtuse lobes. Petals 3 cm., oblong, striate. At 4,000 feet.

Allied to *C. Diepenhorstii*, Miq. var. *singaporensis* but almost completely unarmed. The specimens show no flagella

ARACEAE.

170. *Arisaema Roxburghii*, Kunth. At 3,500 to 4,200 feet.

171. *Homalonena pumila*, Hook fil. A variety with the leaves hardly pustulate. At 4,500 feet.

CYPERACEÆ.

172. *Kyllinga brevifolia*, Rottb. At 4,000 feet.

173. *Fimbristylis globulosa*, Kunth. At 3,000 feet.

174. *Hypolytrum latifolium*, Rich. At 3,500 feet.

175. *Gahnia javanica*, Mor. 5,500 to 6,600 feet.

176. *GAHNIA CASTANEA* sp. nov.

Large tufted plant. Leaves with a broad (2 cm. wide) shining purplish-brown, sheathing base, gradually narrowing to a filiform point 100 cm. long. Panicle 45 cm. long, with spikelets borne on slender scabrid peduncles, about 50 from the axil of a long leafy bract, 2-3 cm. long, with 5 or 6 spikelets towards the apex. Glumes lanceolate, mucronate, chestnut-red, lower one tubular at the base, enclosing 2 or 3 branchlets. Spikelets one-flowered 4 mm. long with imbricate glumes. Stamens 3, with very long filaments, and linear long-acuminate anthers. Ovary cylindric, style very long, black with three long filiform stigmatic arms.

This species is very different from *G. javanica* in having fewer glumes; the flower certainly appears terminal.

177. *Lepidosperma chinense*, Nees. At 6,600 feet.

Occurs also on Mt. Ophir and Gunong Tahan.

178. *Carex Walkeri*, Arn. At 6,600 feet elevation.

A fine addition to our flora, and very fine specimens. The glumes in this form are very conspicuously scarious at the tip.

Native of South India, Ceylon and Java and the Philippines.

179. *Scleria radula*, Hance. At 4,200 feet elevation.

GRAMINEÆ.

180. *Isachne javana*, Nees. At 6,600 feet.

181. *I. Kunthiana*, W. & Arn.

The same form as that obtained on Mt. Kinabalu by Dr. Haviland, and very different from the lowland plant of the Malay Peninsula said to be *I. Kunthiana*, notably in its glabrous glumes and the denticulate edge of the leaf.

182. *Panicum indicum*, L. At 3,000 feet alt.

FILICES.

183. *Alsophila dubia*, Bedd. At 3,500 feet.

184. *Cibotium Barometz*, Link. From 3,500 to 4,000 feet

185. *Hymenophyllum Smithii*, Hook. At 6,500 feet.

186. *Trichomanes pyxidiferum*, L. At 5,000 feet.

187. *Trichomanes pallidum*, Bl. At 6,600 feet.

188. *Trichomanes pluma*, Hook. At 6,000 to 6,600 feet.

189. *Trichomanes gemmatum*, Sm. At 5,500 feet.

190. *Trichomanes apiifolium*, Presl. At 5,500 to 6,000 feet.

191. *Trichomanes maximum*, Bl. At 4,000 feet.

192. *Prosaptia Emersoni*, Presl. At 4,200 feet.

193. *Prosaptia contigua*, Sw. At 4,500 to 5,000 feet.

194. *Davallia moluccana*, Bl. At 4,500 feet.

195. *Lindsaya scandens*, Hook. At 4,000 feet.

196. *Lindsaya flabellulata*, Hook. At 6,000 feet.

197. *Schizoloma lobata*, Pers. At 4,000 feet.

198. *Litobrochia incisa*, Thunb. At 4,200 feet.

199. *Lomaria procera* var. *vestita*. At 6,600 feet.

200. *Diplazium porrectum*, Wall. At 5,000 feet.

201. *Diplazium asperum*, Bl. At 5,000 feet.

202. *Diplazium bantamense*, Bl. At 4,000 feet.

203. *Diplazium sylvaticum*, Presl. At 5,000 feet.

204. *Didymochlaena lunulata*, Desv. At 4,500 feet.

205. *Lastraea calcarata*, Bl. At 4,200 feet.

206. *Nephrodium truncatum*, Presl. At 5,000 feet.

207. *Nephrodium davallioides*, Kze. At 4,000 feet.

208. *Oleandra neriformis*, Cav. At 4,200 to 5,000 feet.
209. *Polypodium nutans*, Bl. At 6,000 feet. Only known previously from Mt. Ophir and that dubiously.
210. *Pleopeltis musæfolia*, Bl. At 4,200 feet.
211. *Gymnogramme calomelanos*, Kaulf. At 4,000 feet.
212. *Vittaria elongata*, Sw. At 5,200 feet.
213. *Tænitis blechnoides*, Sw. At 4,200 feet.
214. *Chrysodium bicuspe*, Hook.

LYCOPODIACEÆ.

215. *Lycopodium filiforme*, Roxb. At 4,000 feet.
216. *Lycopodium casuarinoides*, Spring. At 6,600 feet.
217. *Selaginella Wallichii*, Spring. At 3,500 feet.
218. *Selaginella Morgani*, Zeill. At 6,000 feet.

MISCELLANEA.

THE VERTEBRATE COLLECTIONS OF THE FEDERATED MALAY STATES MUSEUMS.

The collection of terrestrial vertebrates from the Malay Peninsula in the possession of the Federated Malay States Museums is now so nearly complete that it may be of interest to give some comparative figures concerning it.

In 1899 and 1900, Capt. Stanley Flower, then in charge of the Bangkok Museum, devoted much attention to the mammalian fauna of Siam and the Malay Peninsula, and, after studying all the available collections both local and in the British Museum, compiled a list which is published in the *Proceedings of the Zoological Society of London*, 1900, pp. 306-379. A summary of his list gives the following figures:

	Species.
Primates	10
Carnivora	28
Ungulata	14
Rodentia	30
Insectivora	6
Cetacea	5
Sirenia	1
Edentata	1
Chiroptera	39
Total ...	134

The intensive study of mammals can only have said to have begun with the opening days of the present century, and since 1899 very great attention has been paid to the Malaya Peninsula and region, principally by Doctor W. L. Abbott, of Philadelphia, whose collections have been worked out by Messrs. G. S. Miller and M. W. Lyon of the United States National Museum at Washington, and by the Federated Malay States Museums. It had been pointed out by English naturalists and by the authorities of the British Museum that it was unfortunate that the proper study of the fauna of a British Possession could only be effectively carried out in a foreign Museum, owing to the lack of modern material in the national collection. As a result, since 1908 very much of the energy of the Museum staff and considerable sums of money have been devoted to removing this reproach. After five years' work, figures dealing with the mammalian fauna of the Malay Peninsula now stand as follows;

NUMBER OF RACES OF MAMMALS KNOWN FROM THE MALAY
PENINSULA AND ADJACENT ISLANDS, 1913.

	Total Number.	Number in Federated Malay States Museums.
Primates	... 20	... 19
Carnivora	... 34	... 32
Ungulata	... 22	... 19
Chiroptera	... 63	... 46
Insectivora	... 26	... 24
Rodentia	... 118	... 112
Cetacea	... 8	... 4
Sirenia	... 1	... —
Edentata	... 1	... 1
	— —	— —
Total	... 293	... 257
	— —	— —

Of the additions to the list 71 races have been described either from material actually in the Federated Malay States Museums or from specimens collected and sent to the British Museum.

The 36 forms not represented in the local Museums with the localities from which they were obtained are as follows:

1. *Macaca capitalis* Trang.
2. *Arctonyx dictator* Trang.
3. *Lutra macrodus* ?
4. *Bos sondaicus butleri* Perak.
5. *Tragulus stanleyanus* Uncertain.
6. *Rhinoceros sondaicus* —
7. *Sciuropterus genibarbis malaccanus* Malacca.
8. *Pteromyscus pulverulentus* Malacca.
9. *Sciuropterus phayrei* North Malay
Peninsula.
10. *Sciurus caniceps epomophorus* Salanga Island.
11. *Epimys pullus* Tioman Island.
12. *Gunomys varius varillus* Penang Island.
13. *Ptilocercus lowi continentis* Klang Gates,
Kuala Lumpur.
14. *Gymnura gymnura* South Malay Pen-
insula.
15. *Balænoptera indica*)
16. *Physeter macrocephalus*)
17. *Steno plumbeus*) Surrounding seas.
18. *Sotalia sinensis*)
19. *Halicore duyong*)
20. *Pteropus intermedius* Trang.
21. *Rhinopoma microphyllum* Ghirbi.
22. *Taphozous saccolæmus* Peninsula.
23. *Chærephon plicatus* Peninsula.
24. *Chærephon johorensis* Johore.
25. *Myotis oreias* Singapore.
26. *Myotis emarginatus* Biserat.

27.	<i>Pipistrellus imbricatus</i>	...	... Peninsula.
28.	<i>Pipistrellus ridleyi</i>	...	... Selangor.
29.	<i>Pipistrellus tenuis</i>	...	... Penang.
30.	<i>Hesperoptenus tomesi</i>	...	... Malacca.
31.	<i>Chilophylla hirsuta</i>	...	... Port Swettenham.
32.	<i>Rhinolophus cœlophyllus</i>	...	... Kedah.
33.	<i>Hipposideros stoliczkanus</i>	...	... Penang.
34.	<i>Petalia tragata</i>	...	... Peninsula.
35.	<i>Kerivoula picta</i>	...	... Penang.
36.	<i>Kerivoula bicolor</i>	...	... Jalor.

The original specimens of Nos. 2, 4 and 13, which were at the time unique, have been deposited in the National Museum at South Kensington.

Of the remaining 33, 26 species are of marine or nocturnal habits and are, therefore, difficult to obtain; *Gunomys varius varillus* is an introduced form in Penang; *Epimys pullus* is a small rat from Tioman known from one specimen only, while *Tragulus stanleyanus*, though said to occur in Batang Padang, has never been obtained of late years. The last species *Gymnura gymnura* is the southern race of the common *tikus bulan* found throughout the Peninsula.

The total number of birds ascribed to the Malay Peninsula on any evidence, good, bad or indifferent, is now 654. Of these, 26 are either species identical with other forms or which have been recorded from the region erroneously or on the strength of wrongly identified or captive specimens, leaving 628 species about which no doubt exists.

Of these the Federated Malay States Museums possess specimens of 589, leaving 39 species still to be procured. Of these 39, we have at different times possessed examples of six, which have either been transferred to the British Museum or perished from defective preservation. Of the remaining 33 forms, four are oceanic birds, rarely approaching land, six are marsh or shore birds, nine are migratory species only resting in the Peninsula for very short periods on their way north or south, two are owls of extreme rarity, one (*Acridotheres torquatus*) is known from one specimen only which ought to be in the Singapore Museum but cannot now be found, while the remaining eleven are known almost entirely from the extreme north of the Peninsula, though one (*Cyornis rueckii*) of very doubtful validity is described from Malacca.

The only additions to be looked for are, therefore, either occasional migrants or actual novelties, which are necessarily few and far between, as, ornithologically speaking, the Malay Peninsula is better known than almost any other area of equal extent in Asia.

As showing the advance that has been made in the last thirty years, Hume, in 1880, gives the number of birds actually known from the Malay Peninsula as 459, of which he had procured 415. The corresponding figures are now 628 and 589, or increases of 34.6 and 41.9 per cent., respectively.

SPECIES RECORDED FROM THE MALAY PENINSULA BUT NOW
REMOVED FROM THE LIST FOR VARIOUS REASONS.

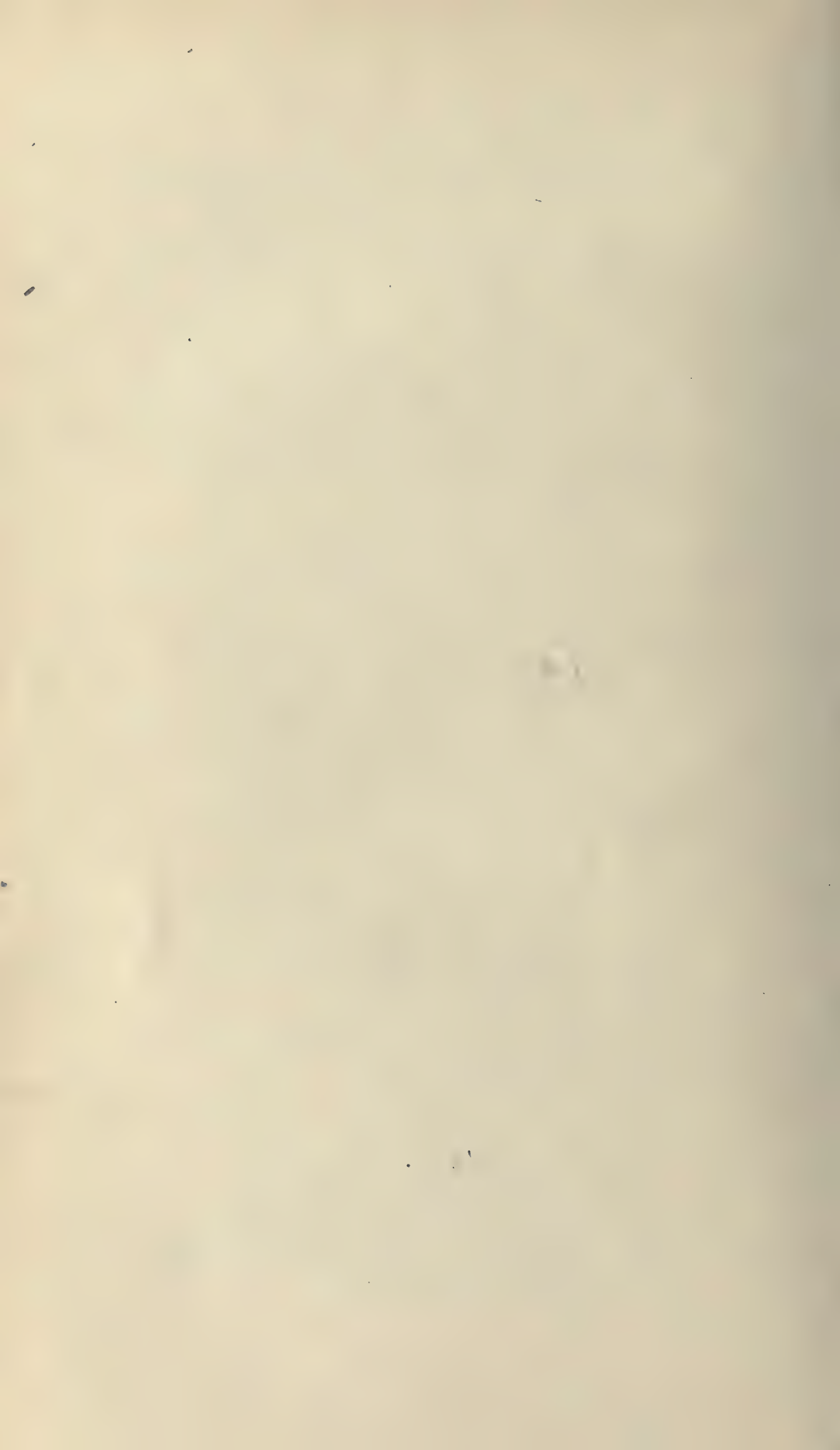
- 28.* *Carpophaga griseicapilla*
(Wald.) ... Wrong identification, = *C. badia* (Temm.)
34. *Turtur humilis* (Temm.) ... Specimens almost certainly caged.
53. *Seena seena* (Sykes.) ... Specimens examined = *Sterna media* (Horsf.)
55. *Sterna longipennis*, Nordm. *Sterna tibetana*, Saunders,
80. *Himantopus himantopus*
(Linn.) ... Transposed label.
130. *Nyroca fuligula* (Linn.) ... Alleged collector obtained the dry skin only; real locality therefore doubtful.
175. *Falco severus*, Horsf. ... No definite locality.
183. *Scops sunia*, Hodgs. ... = *Scops malayana*, Hay
220. *Halcyon humii*, Sharpe ... Identical with *H. armstrongi*, Sharpe.
307. *Iyngipicus pumilus*,
Hargitt ... Not separable from *I. canicapillus*, Blyth.
310. *Dendrocopus analis* (Horsf.) No authentic locality or collector.
316. *Micropternus phæocephalus*,
Blyth ... Specimen identified as such is *M. brachyurus* (Vieill.)
353. *Cyornis tickelliae*, Blyth ... Specimens identified as such are *C. sumatrensis*, Sharpe.
354. *Cyornis frenata*, Hume ... Female of *C. erythrogaster*, Sharpe.
357. *Cyornis turcosa*, Bruggem ... Female of *C. elegans* (Temm.)
384. *Stoparola melanops* (Vig.) Specimens identified as such are *S. thalassinoides* (Cab.)
425. *Pycnonotus blanfordi*, Jerd. *P. robinsoni*, Grant.
390. *Pericrocotus fraterculus*,
Swinh. ... Specimens identified as such are *P. flammifer*.
455. *Setaria melanocephala*,
Davison ... Type and topotypes are indistinguishable from *S. affinis* (Blyth).
- 463A. *Stachyris nigriceps* (Hodgs.) *C. davisoni*, Sharpe

* The numbers quoted are those of "A Hand-list of the Birds of the Malay Peninsula, south of the Isthmus of Kra" by H. C. Robinson, Kuala Lumpur, 1910.

- | | | |
|-------|---|--|
| 476A. | <i>Myiophonus temmincki</i> , Vig. | <i>M. crassirostris</i> , Robinson |
| 557. | <i>Sturnia malabarica</i> (Gm.) ... | Escaped cage bird or
transposed label |
| 558. | <i>Sturnia nemoricola</i> (Jerd.) ... | Do. do. |
| 562. | <i>Sporæginthus amandava</i>
(Linn.) | Do. do. |
| 563. | <i>Sporæginthus flavidiventris</i>
(Wall) | Do. do. |
| | <i>Ruticilla aurea</i> , Temm. ... | No authentic locality. |

SPECIES UNDOUBTEDLY OCCURRING IN THE MALAY
PENINSULA BUT NOT REPRESENTED BY LOCAL SPECIMENS
IN THE FEDERATED MALAY STATES MUSEUMS.

14. Rheinwardtii nigrescens, Rothsch.
48. Porphyrio edwardsi, Elliot.
64. Anous stolidus (Linn.)
65. Micranous leucocapillus, Gould.
67A. Hoplopterus ventralis (Wagl.)
73. Ochthodromus veredus (Gould).
104. Thaumatibis gigantea (Oust.)
107. Leptoptilus dubius (Gm.)
131. Plotus melanogaster (Gm.)
133. Phalacrocorax javanicus (Horsf.)
134. Fregata aquila (Linn.)
136. Phæthon indicus, Hume.
138. Pelecanus roseus, Gm.
142A. Neophron ginginianus (Lath.)
145. Circus pygargus, Linn.
157. Circaetus hypoleucus (Pall.)
179. Asio otus (Linn.)
192A. Glaucidium radiatum (Temm.)
194. Strix javanica (Horsf.)
203. Coracias affinis, McClell.
208. Pelargopsis burmanica, Sharpe.
245. Collocalia gigas, Hartert.
268. Cuculus canorus, Linn.
275. Chalcococcyx basalis (Horsf.)
302. Gecinus robinsoni, Grant.
324. Hemicircus canente (Less.)
351. Cyornis ruecki, Oust.
414. Microtarsus cinereiventris (Blyth).
416. Criniger salangæ, Sharpe.
441. Timelia jerdoni, Walden.
491. Oreocichla affinis, Richm.
507. Sutoria sutoria (Forst.)
517. Acanthopneuste trochiloides, Sundev.
520. Acanthopneuste magnirostris (Blyth).
544. Dicrurus nigrescens, Oates.
560. Acridotheres torquatus (Davison).
572. Chlorura sp.
576. Motacilla feldeggii, Mich.
579. Motacilla taivanus, Swinh.



THE SEMANG BETWEEN JANING AND RAMAN.

by

F. O. B. DENNYS.

[During a recent conversation with Mr. F. O. B. Dennys, of Taiping, he mentioned to me that he had once met a tribe of naked Semangs in the far north of Perak. As I believe that there is so far no record of any tribe in the Peninsula absolutely dispensing with clothes I asked him to write down what he could remember about them. This he has very kindly done in a letter from which I have made the following extract. I. H. Evans.]

"About 1897 I went on a prospecting tour from Janning up to Rhaman and after leaving Janning on elephants we went through rather hilly country. On our second day away—I should say about 1,500 feet above sea level—we got to a fairly large stream and noticed that there were the remains of a Sakai camp. The Malays said they were Semangs and I told the *Gěmbala* to try and make them come and see me if he could find any and after a good deal of trouble he managed to get some of them to come near our camp. They were rather short and very dark skinned, with very close, curly hair—rather heavy about the shoulders in build, put poor below the belt. They did not understand Malay, but the *Gěmbala* (elephant driver) could make himself understood. After giving them some tobacco and rice they got more friendly and others appeared, in all about 15 to 20 turned up, and I noticed they were no clothes of any description, either men or women, and I think there were about 6 or 7 women. This was the cause of some amusement to my followers, who said only monkeys went naked. I got the *Gěmbala* to show me their present camp and I noticed they had small shelters built up in trees, but nothing on the ground. They could hardly be called huts as there were sticks to act as a flooring and the roofing was of leaves. This is all I can remember of the Semangs."



H. C. Robinson, Photo.

SENOI OF SUNKAI, PERAK



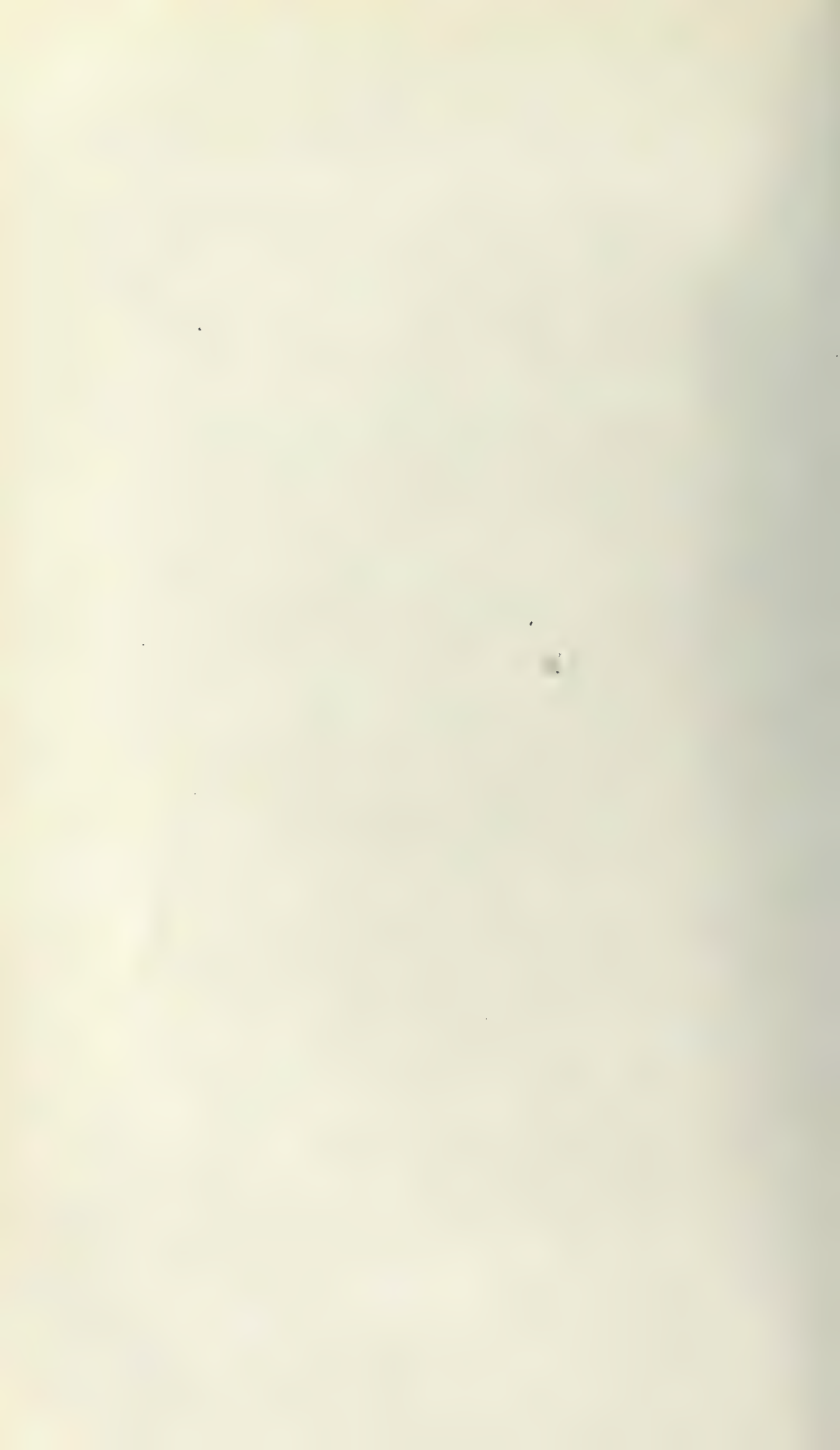
H. C. Robinson, Photo.

SENOI OF SINGKAI, PERAK.



H. C. Robinson, Photo.

SENOI OF SINGKAI, PERAK.





C. B. Kloss, Photo.

UP-RIVER SENOI OF SUNKAI, PERAK.



C. B. Kloss, Photo.

SENOI OF ULU SUNKAI, PERAK.



C. B. Kloss, Photo.

SENOI OF JERAM KAWAN, SUNGKAI RIVER, PERAK.



C. B. Kloss, Photo.

SENOI OF JERAM KAWAN, SUNGKAI RIVER, PERAK.



C. B. Kloss, Photo.

SENOI OF JERAM KAWAN, SUNGKAI RIVER, PERAK.



C. B. Kloss, Photo.

SENOI OF JERAM KAWAN, SUNGKAI RIVER, PERAK.



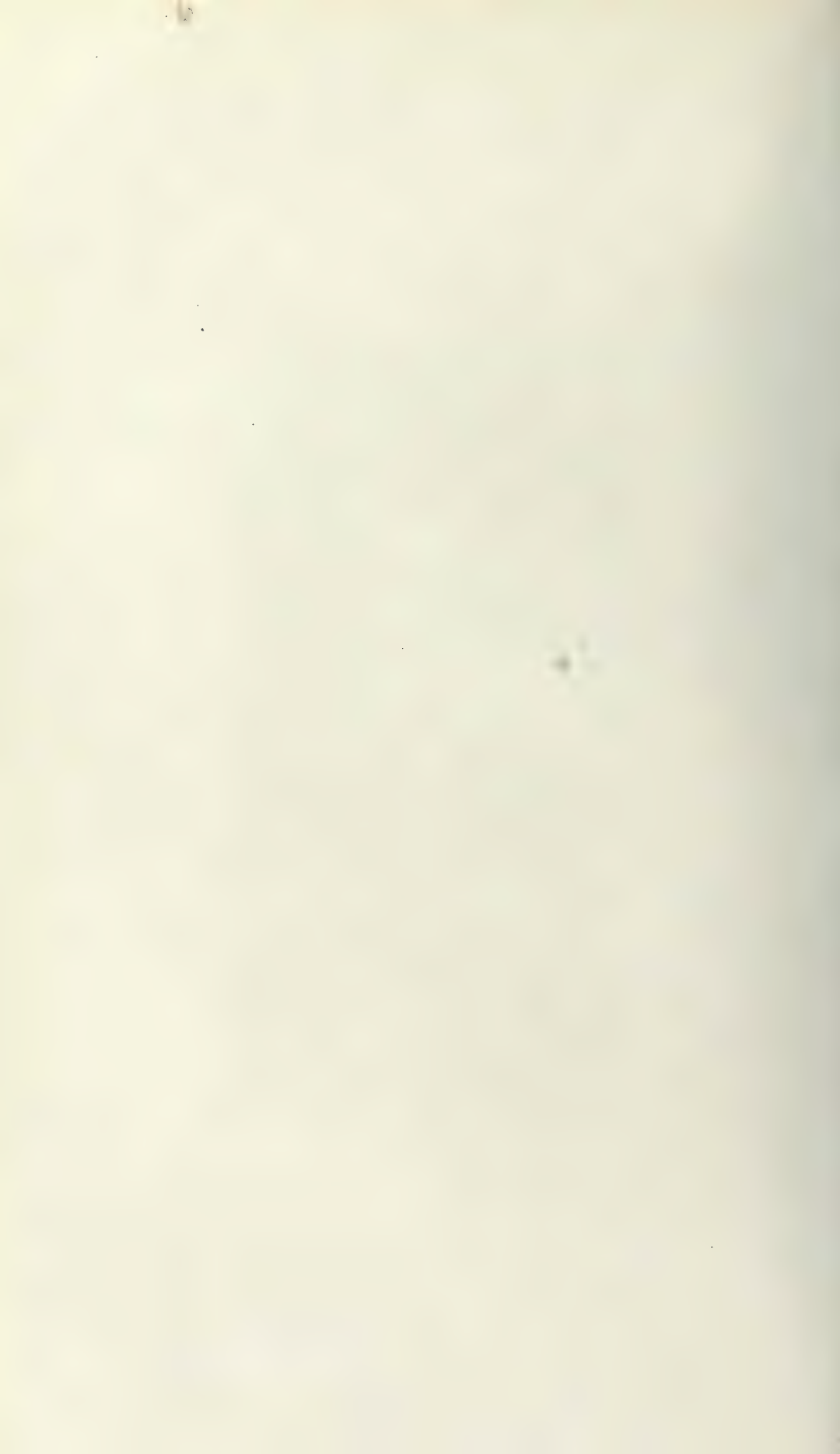
C. B. Kloss, Photo.

SENOI OF JERAM KAWAN, SUNKAI RIVER, PERAK.



C. B. Kloss, Photo.

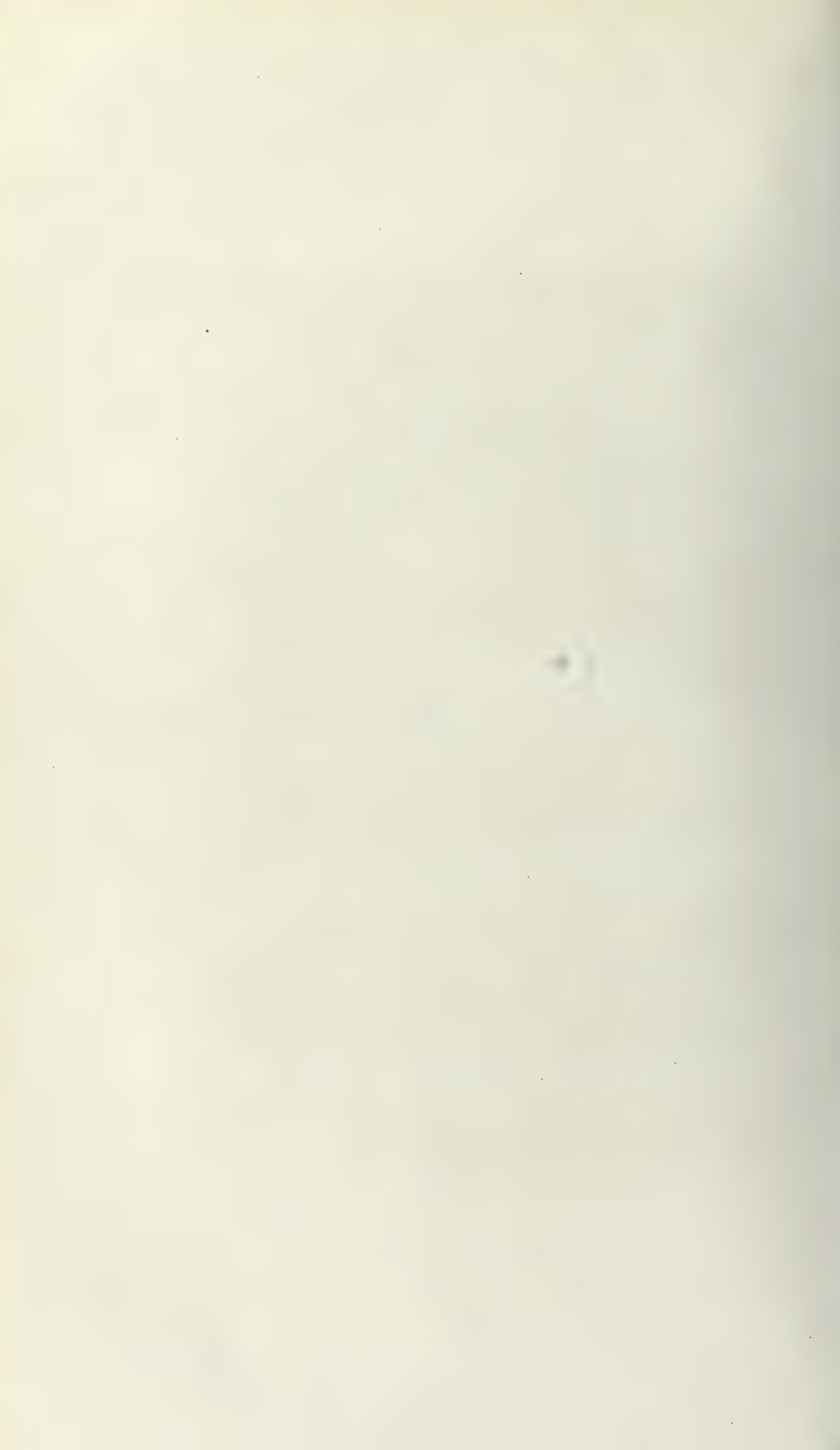
SENOI OF JERAM KAWAN, SUNCKAI RIVER, PERAK.





C. B. Kloss, Photo.

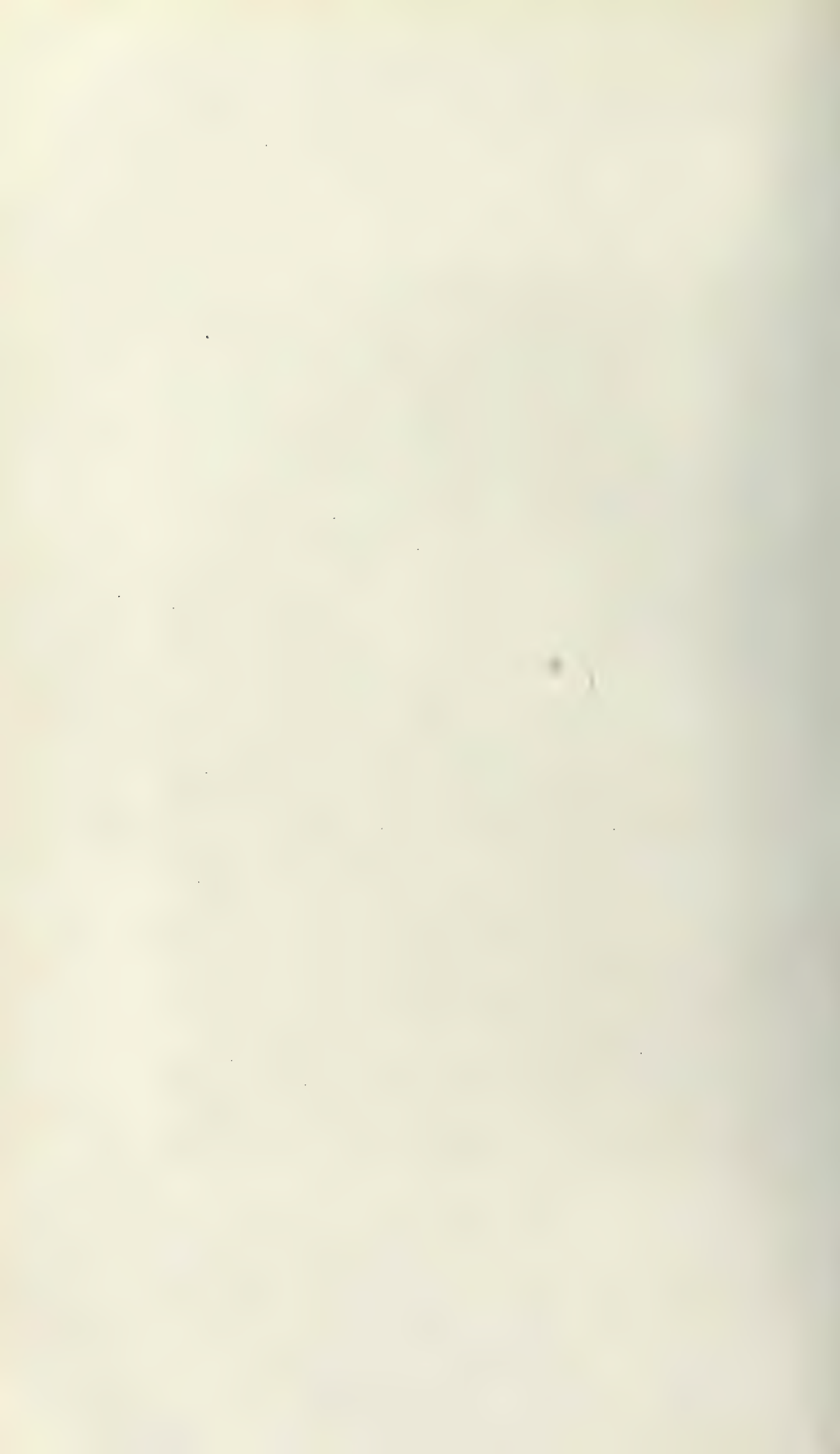
SENOI OF JERAM KAWAN, SUNKAI RIVER, PERAK.





C. B. Kloss, Photo.

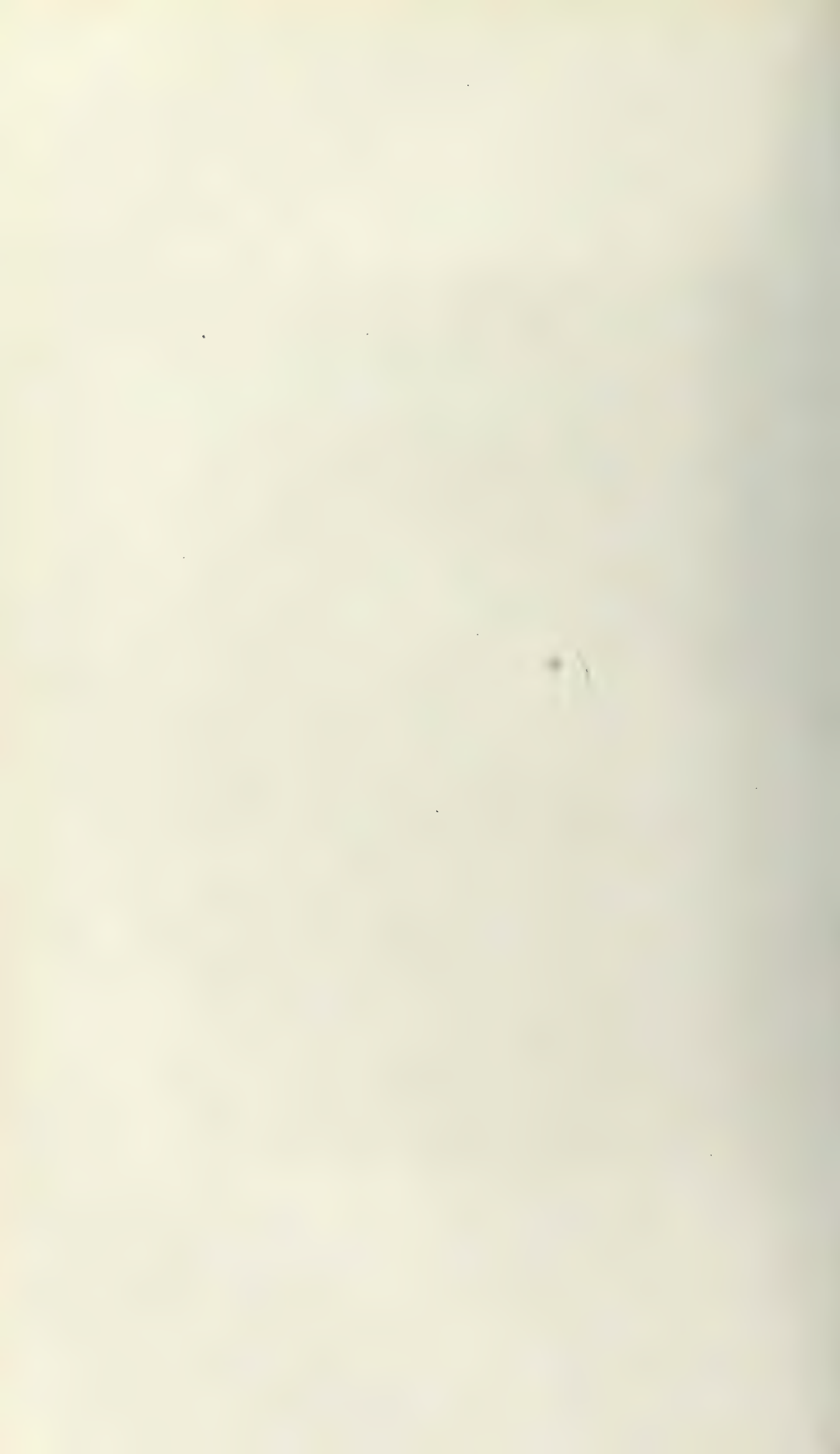
SENOI OF SLIM, PERAK.





C. B. Kloss, Photo.

SENOI OF SLIM, PERAK.





C. B. Kloss, Photo.

HOUSE OF SENOI SAKAI NEAR SUNGKAI, PERAK.



C. B. Kloss, Photo.

SENOI OF SUNGEI MUDA, ULU SLIM, PERAK.



C. B. Kloss, Photo.

SENOI OF SUNGEI MUDA, ULU SLIM, PERAK.



C. B. Kloss, Photo.

SENOI OF SUNGEI MUDA, ULU SLIM, PERAK.



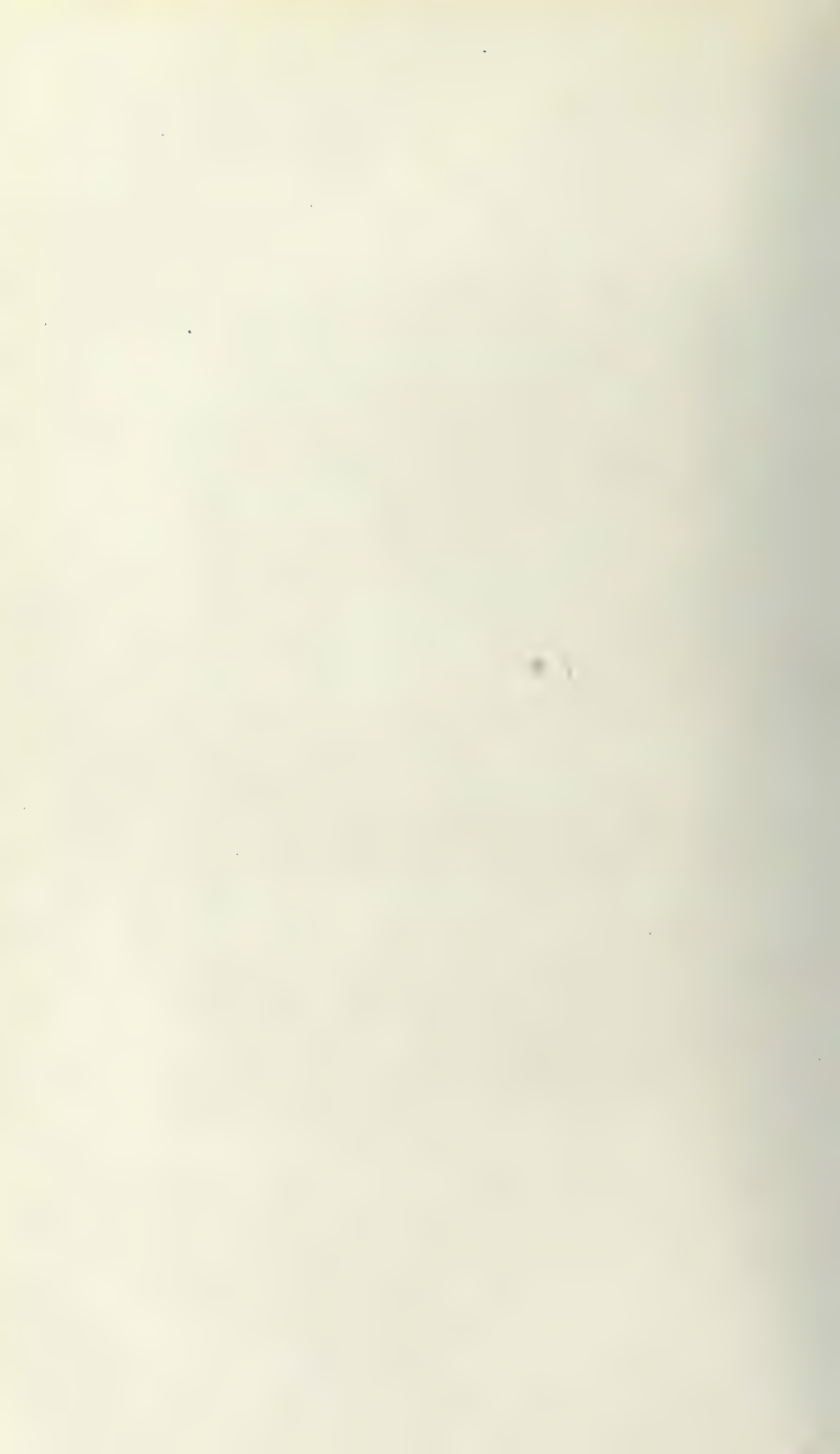
G. B. Klass, Photo.

SENOI OF SUNGEI MUDA, ULU SLIM, PERAK.



C. B. Kloss, Photo.

SENOI WOMEN OF SUNGEI MUDA, ULU SLIM, PERAK.

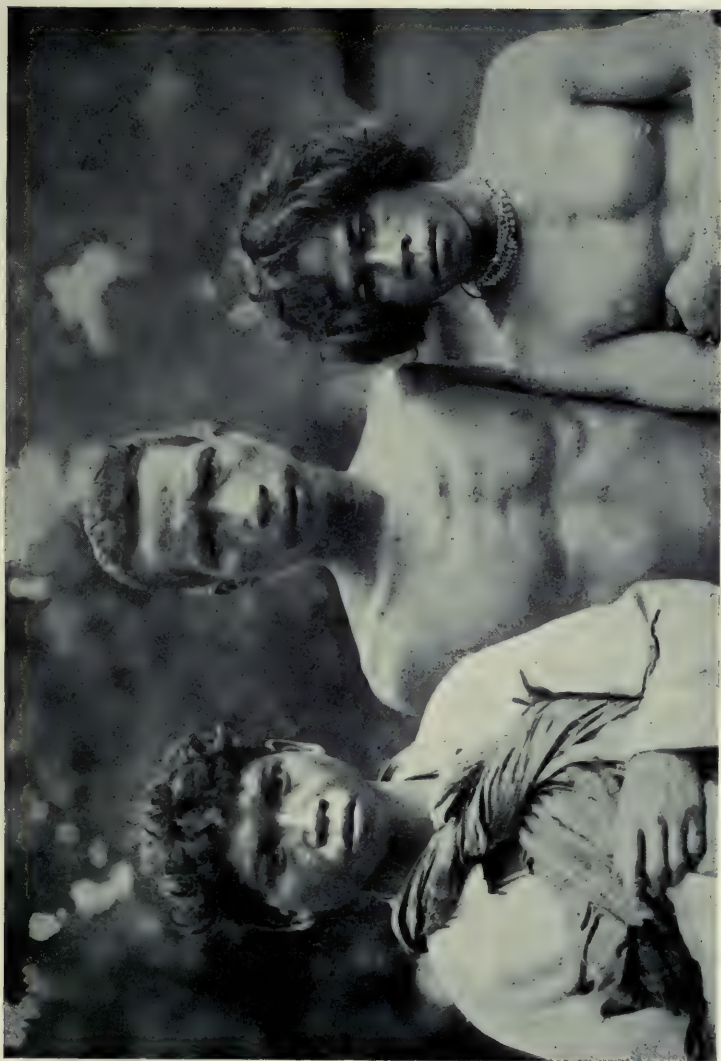




C. B. Kloss, Photo.

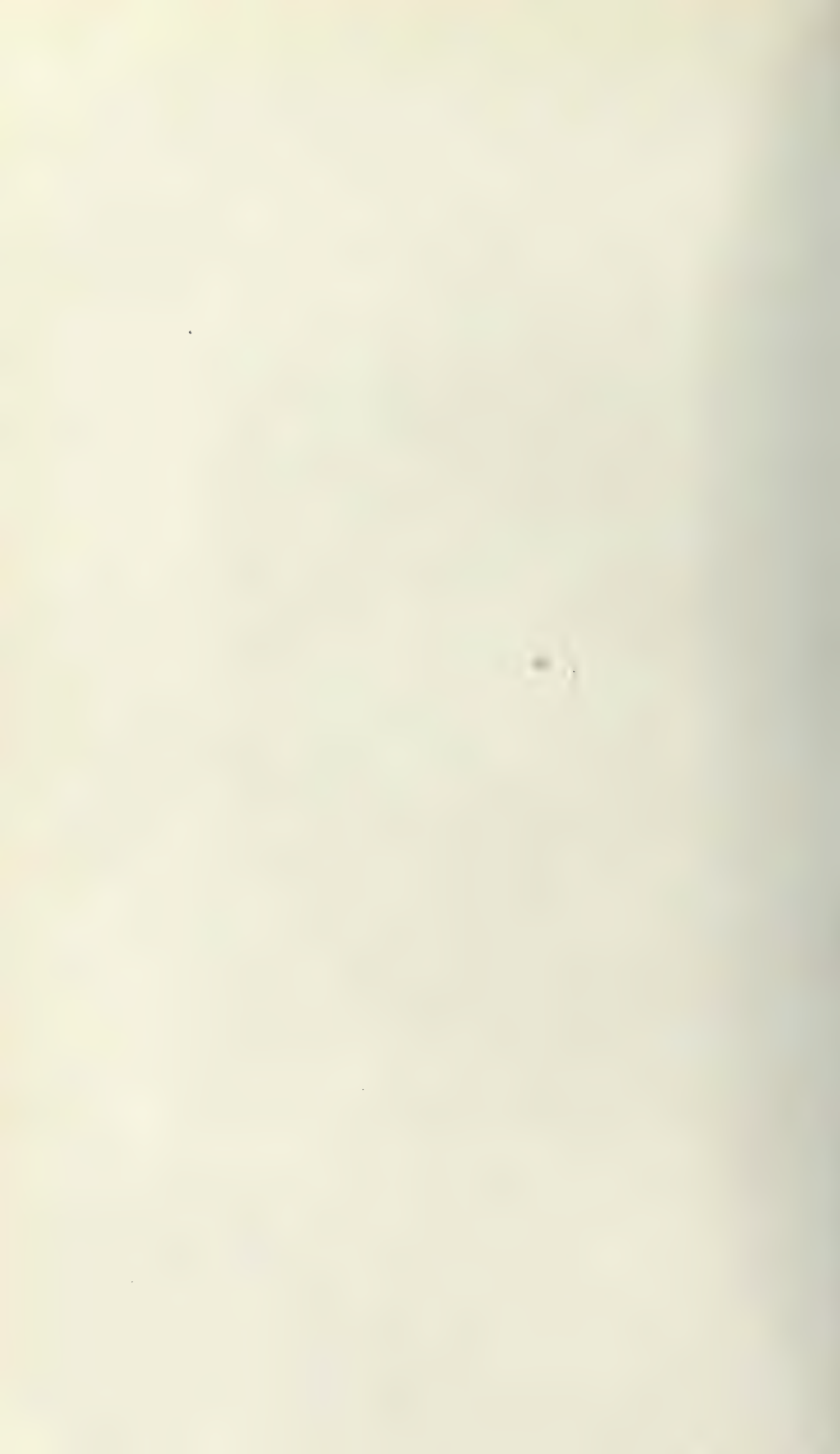
SENOI WOMEN OF SUNGEI MUDA, ULU SLIM, PERAK.

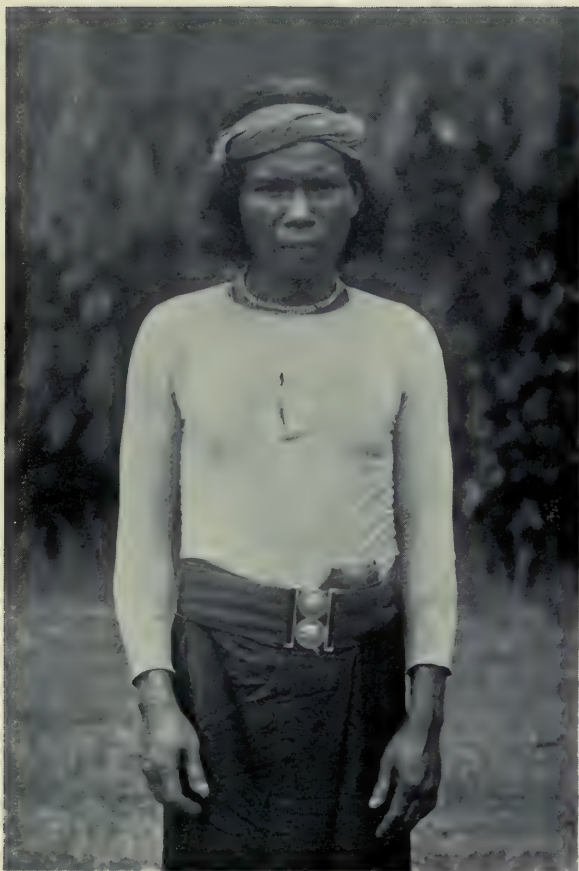




C. B. Kloss, Photo.

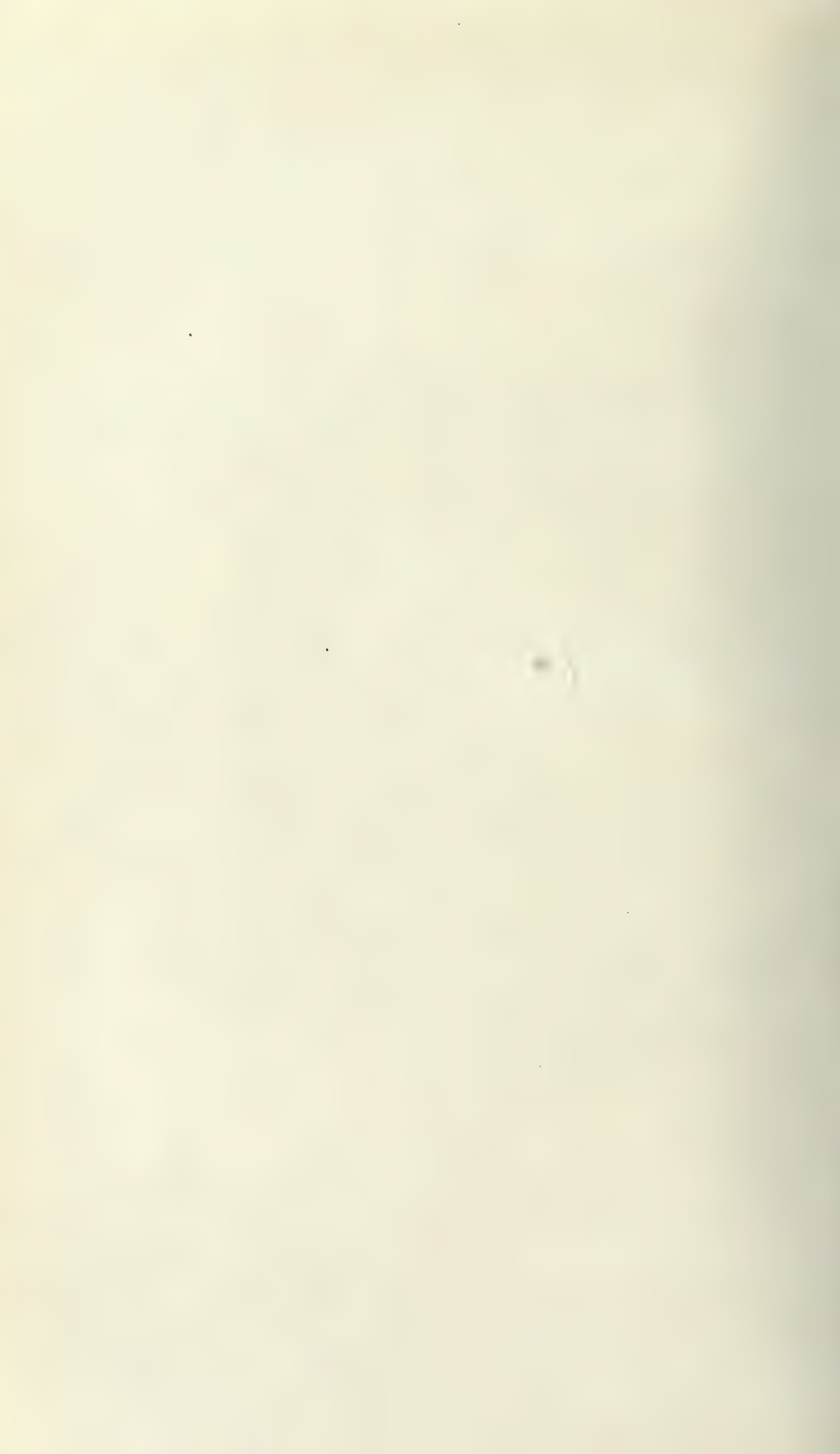
SENOI OF SUNGEI MUDA, ULU SLIM, PERAK.





C. B. Kloss, Photo.

SENOI OF SUNGEI KÖL, ULU SLIM, PERAK.



IX. MEASUREMENTS OF SOME SAKAI
OF SUNGKAI AND SLIM, SOUTH PERAK, WITH
NOTES ON THE SAME (Plates I—XXIII).

By C. BODEN KLOSS, F.R.A.I.

NOTES.

The hair of all these people was black; by which is meant a sooty or rusty tint, not a shining or dead black colour. The colour of their skin varied between tints 3 and 4 of Broca. Their bodies were in normal condition, neither stout nor thin, and generally bore only slight traces of hair, though a few individuals were glabrous. All called themselves "Senoi," all were bilingual and all the parties met with had "penghulu" sometimes two or three to a party. They had no *bomor* or *pawang*.

Nos. 1—5 (*see* Table of Measurements).

Living between the road and the railway line about two miles south of Sungkai Station in small clearings cultivated with rice, bananas, sugarcane and tapioca. The floors of some of the houses in this settlement were barely raised above the ground, others were from three to six feet high and beneath these latter goats were penned. Roofs were of lalang grass, walls of palm leaf and floors of bamboo, covered with pandanus mats, some of which were very finely woven. Three or four blowpipes and quivers were obtained and a few arrows. These weapons were made by the Sakai of the hills and evidently were very little used by these people, who owned several old muskets. Malay garments were in general use and also common forms of Malay utensils and implements, such as rice strainers and winnowers.

Some of this party gave their tribal name as "Senoi Sakai Burong." The quiver-cover was of rattan, circular, and flattened on top.

Nos. 6—7.

Came from some miles up the Sungkai river. Both appeared to have retained their primitive condition, wore bark cloth 'chawat,' and had forehead and nose streaked with vertical blue lines. Both suffered from skin disease. The quiver cover was of pandanus leaf, elongate, triangular and flattened on top.

Nos. 8—13.

Members of a group of 10 individuals, men, women and children, felling jungle on contract for a rubber estate near Sungkai. One or two of the party wore bark cloth 'chawat,' the remainder possessed Chinese trousers or Malay sarongs.

September, 1915.

Said to be from the Ulu Sungkai and called themselves "Senoi." Skin disease (Kurap) was very prevalent among these people.

Nos. 14—31.

Living near Jeram Kawan on the Sungkai River or higher up in the hills. Houses built on piles 3-6 ft. high, bertam palm roof and sides, bamboo floors: clearings contained tapioca, sugarcane, bananas, with langsat and durian trees. A few small dogs were to be seen, generally tied by a hind leg to a house post.

This party were free from "Kurap." Many had painted their faces, the pattern consisting of either a red or yellow ground on which black markings were laid. The painting on the women was more ornate than on the men; girl children were less elaborately decorated than the adults. The latex of the Jelutong tree (*Dyera costulata*) was used for this purpose.

The men wore bark-cloth 'chawat,' fillets of bark-cloth twisted round grass with pendants of grass overhanging the nape, also woven fillets of palm leaf. Women all wore either sarongs or sheets of bark-cloth supported by a belt in which they kept young squirrels or rats, suckling them from time to time. Other ornaments were ear plugs of leaves, leaf decoration in their chignons, hair combs and skewers: attached to their girdles were bunches of sweet-scented grasses and fibre. The principal use of the combs was for scratching the scalp when parasites became too active. Both sexes wore nose skewers up to 8 or 9 inches in length, bracelets and necklaces of coloured beads and seeds and silver rings.

This group had no dances but sang well. Women sat pounding on stones with the end of a short piece of bamboo closed by its internode (chentukn) while the men sat and sang together. The form of quiver cover was similar to that used by Nos. 1-5.

Men's head fillets	...	...	Chĩnkoi.
Bark cloth of men's fillets	...	...	Galūk.
Creels or small bark baskets	...	...	Raga.
Small pouches for tobacco, etc.	...	...	Tapok.
Leaf bunches worn by women	...	...	Běnmong.
Woman's ear ornaments	...	...	Slebak.
Woman's combs	...	...	Soréh.

Nos. 32—35.

Living in a clearing, a couple of miles south of Slim near the road, in two very substantial houses of bertam with bamboo floors raised 5 ft. The only true Sakai objects in their possession were blow pipes and quivers; all their implements, though made by themselves, were of Malay type. In threshing padi, of which they possessed a quantity, they placed a heap of ears in a mat and rubbed the grains out with the feet; I saw them spear water tortoises in the stream by means of a long

sapling fitted with an iron head. Here was obtained a beautifully ornamented blow pipe and a quiver with a slightly conical cover, both made by one of this party. The maker (a Mai Darat Senoi) stated that blow pipe covers are made by individuals to suit their own fancies, either like this specimen or with the flattened tops as seen in the other groups. These people wore clothes (jackets and trousers) and had attained a social state which they were superficially at any rate most unattractive, the reason given by one man for a shaven head was that previously bugs had worried him unbearably.

Nos. 36—39.

Came into Slim from the hills. Three out of the four were more or less clothed in Malay cotton garments.

Nos. 40—52.

Came into Slim from the Sungei Muda. Except for the headman, who wore a wreath, the males were undecorated save for face paint. The costume and ornaments of the women resembled those of the Jeram Kawan Sakai but they had, in addition, lavishly ornamented their heads with pink *Ixora* flowers. With regard to face painting, combs and blow-pipe patterns it was stated that these were used at will and that whatever was fancied was drawn. No patterns were private property, none had any significance however used, being merely ornamental to suit the maker's taste and all had been employed from time beyond memory. Faces are painted for songs, weddings and any occasions of a ceremonious nature (such as a visit to a European). There were no dances.

No. 53.

From Sungei Kol above Sungei Muda. The only member of the group (three *klamin*, one *penghulu*) inhabiting that locality remaining, the rest having crossed the hills for a long visit to Pahang.

Number	..	..	1	2	3	4	5
Sex	..	..	M.	M.	M.	M.	M.
Age	..	..	35	45	20	25	30
Name	..	..	Rang	Jinrus	Pulai	Git	Jahya
Height of Stature	..		1,592	1,544	1,510	1,472	1,554
Girth of Chest	..		797	752	786	750	822
Vertex to Tragus	..		138	129	131	131	136
Length of Head	..		180	172	182	174	180.5
Breadth of Head	..		141	137	139	138	146
Length of Face	..		106	100	111	106	110
Breadth of Face	..		133	129	130	129	135
Bigonial breadth	..		125	114	109	110	122
Length of Nose	..		40	44	45	44	46
Breadth of Nose	..		42	42.5	43	38	39
Interocular Breadth	..		32	31	35	32	32
Cephalic Index	..		78.3	79.8	76.4	79.9	80.8
Cephalic Height Index	..		76.6	75.0	72.0	75.2	75.3
Facial Index	..	..	79.7	77.5	85.1	82.2	83.0
Nasal Index	..	..	105.0	96.5	95.5	86.3	84.8
Hair Character	..		Curly	Curly	Very curly	Curly	Curly
Hair on Face	..	..	Slight	Marked	Very slight	Very slight	Medium
Eye Plane	..	..	Slightly oblique	Slightly oblique	Slightly oblique	Slightly oblique	Slightly oblique
Epicanthus	..	..	Medium	Very slight	Slight	Slight	Very slight
Nose	..	..	Short, broad, nearly straight, turned-up	Straight, short, broad, tip depressed	Short, broad, nearly straight, tip flattened	Short, broad, straight	Straight
Nasal Bridge	..	..	Nearly absent	Medium	Medium	Medium	Medium
Lips	..	..	Medium	Medium	Medium	Rather thin	Thick
Prognathism	..	..	Slight labial	Slight labial	Slight labial	Slight labial	Slight labial
Chin	..	..	Square	Round	Retreating	Retreating	Pointed retreating
Shape of Face	..	..	Shield	Shield	Short oval	Shield	Shield
Prominence of Cheek-bones.			Marked	Slight	Slight	Slight	Medium

6	7	8	9	10	11	12
M.	M.	M.	M.	M.	M.	F.
20-25	36	45	20	20	40	20
Ba-hi-luk	Pa Luchong	Chëgam	Nün-chuk	Nia	Chim-bo	Ko-eb
1,533	1,522	1,491	1,505	1,626	1,533	1,400
877	774	736	755	785	795	..
141	135	138	139	141	138	137
187.5	177	173	172	184	183	165
148	141	139	143	147	138	136
115.5	116	97	102	108	124	95
142	132	131	124	133	131	120
122	116	111	110	121	107	108
55	55	45	43	47	53.5	39
44	35	43	38	40	49	38
35	31.5	32	32	36	36	38
78.9	79.6	78.9	83.1	79.8	75.4	82.4
75.2	76.2	79.7	80.8	76.6	75.4	83.0
81.3	87.9	74.0	82.2	81.2	94.6	79.1
80.0	63.6	95.5	88.3	85.1	91.5	97.4
Slightly wavy	Slightly wavy	Slightly wavy	Wavy	Curly	Curly	Wavy
Nearly absent	Slight	Moderate	Nil	Slight	Moderate	Nil
Horizontal	Slightly oblique	Horizontal	Horizontal	Slightly oblique	Slightly oblique	Horizontal
Slight	Absent	Absent	Slight	Marked	Absent	Very slight
Straight, broad, tip depressed	Straight, tip depressed	Straight, broad	Straight, broad, turned up	Concave, turned-up	Straight, flat, tip depressed	Straight, short, broad, turned up
Medium	Marked	Slight	Medium	Nearly absent	Medium	Medium
Medium	Rather thin	Thin	Medium	Medium	Medium	Medium
Absent	Absent	Absent	Slight	Slight	Medium	Medium
Pointed	..	Round	Round	Round	Round, prominent	Round, retreating
Shield	Long oval	Elliptic	Shield	Long oval	Long oval	Long oval
Medium	Marked	Slight	Slight	Slight	Marked	Slight

Number	..	..	13	14	15	16	17
Sex	..	..	M.	M.	M.	M.	M.
Age	..	..	25	17	25	20	20
Name	..	..	Ni-îr	Galúk	Yök-gading	Ansorr	Bu-suk
Height of Stature	..	..	1,431	1,412	1,542	1,500	1,463
Girth of Chest	..	..	801	762	831	823	831
Vertex to Tragus	..	..	128	135	139	137	130
Length of Head	..	..	183	184	189	189	177
Breadth of Head	..	..	146	137	139	141	140
Length of Face	..	..	101	99	115	114	116
Breadth of Face	..	..	134	127	136	141	133
Bigonial Breadth	..	..	117	117	117	126	113
Length of Nose	..	..	41	43	49	49	48
Breadth of Nose	..	..	41	40	43	42	36
Interocular Breadth	..	..	35	33	37	42	31
Cephalic Index	..	..	79.7	74.4	73.5	74.6	79.1
Cephalic Height Index	..	..	70.0	73.3	74.3	72.5	73.4
Facial Index	..	..	75.3	78.0	82.7	80.8	87.2
Nasal Index	..	..	100.0	93.0	87.7	85.7	75.0
Hair Character	..	..	Wavy	Curly	..	Curly	Curly
Hair on Face	..	..	Slight	Slight	Absent	Slight	Slight
Eye Plane	..	..	Oblique	Oblique	Oblique	Oblique	Oblique
Epicanthus	..	..	Slight	Absent	Absent	Slight	Marked
Nose	..	..	Very broad, concave, turned up	Straight, broad, turned up, tip depressed	Short, broad, concave, tip depressed	Slightly concave, tip flattened	Straight, flat, turned up
Nasal Bridge	..	..	Nearly Absent	Slight	Medium	Slight	Slight
Lips	..	..	Medium	Thick	Thick	Rather thick	Rather thick
Prognathism	..	..	Slight	Slight labial	Medium	Slight labial	Slight labial
Chin	..	..	Square, prominent	Round, prominent	Round, prominent	Pointed, prominent	Pointed, retreating
Shape of Face	..	..	Shield	Long oval	Shield	Elliptic	Shield
Prominence of Cheek-bones.	..	..	Medium	Slight	Medium	Slight	Slight

18	19	20	21	22	23	24
F.	M.	M.	M.	M.	M.	F.
20	35	18	40	25	15	25
Kin-Manang	Pa Jelpuk	Yök-bün	Pa Loi-un	Bi-Kēdehk	Yök-ton	Han-Kuis
1,478	1,491	1,514	1,452	1,450	1,432	1,360
..	840	762	780	813	760	..
134	134	148	140	140	137	130
169	182	178	177	183	180	168
139	145	143	138	142	143	140
108	108	107	111	115	100	90
126	136	132	127	132	129	121
105	127	117	103	108	112	102
44	48	47	47	44	39	41.5
38	47	39	41	38	37	32
32	31	34	33	31.5	34	29
82.2	79.4	80.3	77.9	77.5	79.4	83.3
79.3	73.6	83.1	79.1	76.5	76.1	77.3
85.7	79.4	81.0	87.4	87.1	77.5	74.4
85.9	97.9	82.9	87.2	86.3	94.8	77.1
Curly	Frizzy	Curly	Curly	Curly	Curly	Rather curly
Nil	Slight	Nil	Slight	Slight	Slight	Nil
Oblique	Slightly oblique	Rather oblique	Rather oblique	Rather oblique	Horizontal	Oblique
Marked	Absent	Marked	Absent	Slight	Marked	Slight
Straight, flat, broad, tip, depressed	Slightly sinuous, turned up	Straight, short, broad, turned up	Straight short, tip flattened and depressed	Convex, short, broad, turned up	Short, broad, concave, tip flattened	Concave
Slight	Medium	Slight	Slight	Slight	Nearly absent	Slight
Rather thick	Medium	Medium	Medium	Rather thick	Medium	Rather thick
Absent	Slight	Absent	Slight labial	Slight	Absent	Slight
Round, prominent	Round	Round	Square, retreating	Square	Pointed	..
Long-oval	Shield	Shield	Shield	Shield	Long oval	Shield
Slight	Medium	Slight	Rather marked	Medium	Medium	Rather marked

Number	25	26	27	28	29
Sex	M.	M.	M.	F.	F.
Age	30	(?)	25	25	40
Name	Yök-sēngoi	Ba-serriok	Yök-teluk	Kin-eurk	Kin-blünk
Height of Stature ..	1,482	1,557	1,415	1,350	1,433
Girth of Chest ..	836	818	900	..	..
Vertex to tragus ..	128	134	140	125	138
Length of Head ..	185	180	183	155	184
Breadth of Head ..	146	137	139	130	133
Length of Face ..	111	111	100	96	105
Breadth of Face ..	134	136	136	121	124
Bigonial breadth ..	124	117	120	108	98
Length of Nose ..	47	41	40	45	44
Breadth of Nose ..	41	38	39	39	39
Interocular Breadth ..	35	30	34	32	37
Cephalic Index ..	78.9	76.1	75.9	83.9	72.2
Cephalic Height Index ..	69.2	74.4	76.5	80.6	75.0
Facial Index ..	82.8	81.6	73.5	79.3	84.6
Nasal Index ..	87.2	92.6	97.5	86.6	86.3
Hair Character ..	Frizzy	Curly	Curly	Wavy	Wavy
Hair on Face ..	Slight	Slight	Slight	Nil	Nil
Eye Plane ..	Slightly oblique	Horizontal	Oblique	Horizontal	Horizontal
Epicanthus ..	Absent	Absent	Absent	Absent	Absent
Nose	Convex, tip flattened	Straight, broad, tip very depressed	Short, broad, slightly convex	Straight, flat, short, broad, tip depressed	Straight, broad
Nasal Bridge ..	Rather slight	..	Rather slight	Slight	Very slight
Lips	Rather thick	Medium	Rather thick	Rather thick	Medium
Prognathism ..	Slight labial	Slight	Slight	Absent	Slight
Chin	Pointed	Prominent	Pointed	Round	Pointed
Shape of Face ..	Shield	Shield	Shield	Shield	Shield
Prominence of Cheek-bones.	Medium	Marked	Medium	Medium	Rather marked

30	31	32	33	34	35	36
M.	M.	M.	M.	M.	F.	M.
40	35	35	30	18	35	35
Pa Raga	Penghulu Dalam	Tapong (Penghulu)	Pa Win	Sari	Jërr-nas	Eu-böl
1,470	1,560	1,698	1,651	1,610	1,465	1,503
798	826	880	834	783	..	835
129	134	147	145	137	137	134
187	187	192	194	185	176	183
145	133	145	148	144	137	147
107	114	115	114.5	119	99	122.5
134	126	140	138	123	128	138
98	117	117	114	119	104	120
46	47	46.5	49	47	38	53
43	44	39	38	39	39	42
31	34	34	32	33	31	31
77.5	71.1	75.5	76.2	77.8	74.4	80.3
69.0	71.6	76.5	74.7	74.0	77.8	79.7
79.8	90.4	82.1	83.0	96.7	77.3	88.7
93.4	93.6	83.8	77.5	82.9	97.4	79.2
Curly	Wavy	Woolly	Curly	Woolly	Curly	Curly
Moderate	Slight	Slight	Slight	Slight	Nil	Slight
Horizontal	Slightly oblique	Horizontal	Slightly oblique	Slightly oblique	Slightly oblique	Horizontal
Absent	Marked	Slight	Slight	Marked	Very slight	Absent
Straight, flat, short, broad	Straight, broad, tip flattened and depressed	Straight	Straight	Short, broad, tip flattened	Short, broad, tip depressed	Convex, tip slightly depressed
Slight	Rather slight	Medium	Medium	Nearly absent	Slight	Marked
Rather thin	Rather thin	Rather thick	Medium	Medium	Rather thick	Medium
Slight	Absent	Slight labial	Slight	Slight labial	Slight labial	Slight
Round prominent	..	Pointed	..	..	Pointed, retreating	Pointed
Shield	Shield	Shield	Long oval	Shield	Shield	Shield
Medium	Medium	Medium	Medium	Medium	Medium	Medium

Number	..	..	37	38	39	40	41
Sex	..	..	M.	M.	M.	M.	M.
Age	..	..	30	17	17	40	40
Name	..	..	Putong	Chen-tol	Aiap	Penghulu Kërrdih	Penghulu Yök-nam
Height of Stature	..	..	1,551	1,449	1,461	1,506	1,545
Girth of Chest	..	..	765	736	872	801	804
Vertex to Tragus	..	..	126	130	132	129	132
Length of Head	..	..	176	178.5	181	177	179
Breadth of Head	..	..	149	147	147	149	152
Length of Face	..	..	108	102	110.5	110	113
Breadth of Face	..	..	139	137	138	140	140
Bigonial Breadth	..	..	121	120	124	114	118
Length of Nose	..	..	45.5	41	40	46	42.5
Breadth of Nose	..	..	40	39	40	40	39
Interocular Breadth	..	..	35	36	35	32	32
Cephalic Index	..	..	84.6	82.3	81.3	84.1	84.9
Cephalic Height Index	..	..	71.5	78.4	72.9	72.9	73.7
Facial Index	..	..	77.7	74.4	88.3	78.5	80.7
Nasal Index	..	..	87.9	95.1	100.0	87.0	91.7
Hair Character	..	..	Curly	Curly	Wavy	Curly	Wavy
Hair on Face	..	..	Slight	Slight	Slight	Moderate	Plentiful
Eye Plane	..	..	Oblique	Oblique	Horizontal	Horizontal	Horizontal
Epicanthus	..	..	Very slight	Very slight	Very slight	Absent	Absent
Nose	..	..	Straight, flat, broad	Straight, flat, short, broad	Straight, flat, short, broad, tip depressed	Straight, flat, short, broad	Straight, flat, turned up
Nasal Bridge	..	..	Slight	Nearly absent	Very slight	Slight	Slight
Lips	..	..	Thick	Rather thick	Rather thick	Medium	Medium
Prognathism	..	..	Slight labial	Slight labial	Slight labial	Absent	Slight labial
Chin	..	..	..	Pointed, retreating	Pointed	Round, prominent	Round
Shape of Face	..	..	Shield	Shield	Shield	Oblong	Oblong
Prominence of Cheek-bones.	..	..	Medium	Medium	Medium	Medium	Medium

42	43	44	45	46	47	48
M.	M.	M.	M.	M.	M.	M.
17	35	18	22	35	18	16
Yök-ampeh	Yök-pa	Nur-seh	Yök-pang	Sün	Yök-bawok	Teh-bang
1,532	1,488	1,552	1,527	1,561	1,555	1,490
750	806	833	820	816	789	741
134	136	135	130	130	134	136
176	181	184	180	188	186	186
150	143	148	149	147	151	143
105	111.5	100	113	117	104	106
133	136	132	138	133	140	138
111	125	115	121	115	125	125
41	41.5	39.5	45	53	48	43.5
35	43.5	41	40	41	41	41
32	33	32	35	35	36	36
85.2	81.2	77.1	82.7	72.8	81.1	76.8
76.1	75.1	73.3	72.2	69.1	72.0	73.1
78.9	81.2	75.7	81.8	87.9	74.3	76.7
85.3	95.4	96.3	88.8	77.3	85.4	94.2
Wavy	Frizzy	Curly	Curly	Frizzy	Curly	Curly
Nil.	Moderate	Nil.	Slight	Moderate	Nil.	Nil.
Horizontal	Horizontal	Oblique	Horizontal	Horizontal	Slightly oblique	Oblique
Slight	Absent	Slight	Marked	Slight	Absent	Marked
Straight, turned up	Straight, flat, broad, tip flattened and depressed	Slightly convex, broad, tip depressed	Straight	Straight	Straight, flat, broad	Short broad
Slight	Very slight	Medium	Medium	Medium	Very slight	Slight
Rather thick	Medium	Thick	Rather thick	Thick	Rather thick	Thick
Slight labial	Slight labial	Slight labial	Slight	Slight	Slight labial	Slight labial
Round	..	Pointed	Round	Round, retreating	Pointed, retreating	Very pointed
Shield	Long oval	Oblong shield	Shield	Shield	Shield	Oblong shield
Medium	Medium	Medium	Marked	Marked	Medium	Medium

Number	49	50	51	52	53
Sex	M.	F.	F.	F.	M.
Age	17	20	40	..	35
Name	Yök-pangai	Indah	Leh-nap	Gitan	Buasuk
Height of Stature ..	1,380	1,148	1,400	1,400	1,601
Girth of Chest ..	..	..	..	..	889
Vertex to tragus ..	125	135	132	130	134.5
Length of Head ..	173	176	178	177	199
Breadth of Head ..	136	137	143	141	150
Length of Face ..	107	106	94	102	112
Breadth of Face ..	125	125	120	132	145
Bigonial breadth ..	107	99	105	118	121
Length of Nose ..	46	42.5	43	41	44
Breadth of Nose ..	39	40	33.5	39	43.5
Interocular Breadth ..	30	37	31	37	36
Cephalic Index ..	78.5	77.8	83.4	79.6	75.3
Cephalic Height Index ..	72.6	76.7	74.1	76.7	67.6
Facial Index ..	85.6	84.8	78.3	77.2	77.2
Nasal Index ..	84.7	94.1	77.9	95.1	98.8
Hair Character ..	Wavy	Curly	Wavy	Wavy	Curly
Hair on Face ..	Slight	Nil	Nil	Nil	Slight
Eye Plane ..	Horizontal	Horizontal	Horizontal	Horizontal	Slightly oblique
Epicanthus ..	Marked	Marked	Absent	Slight	Absent
Nose ..	Straight, broad, tip slightly flattened	Short, broad, concave	Straight	Concave, turned-up	Short, broad straight, tip slightly depressed
Nasal Bridge ..	Slight	Nearly absent	Medium	Slight	Medium
Lips ..	Thick	Rather thick	Medium	Rather thick	Thick
Prognathism ..	Medium	Absent	Absent	Absent	Absent
Chin ..	..	Pointed	Round	Pointed	Round
Shape of Face ..	Shield	Long oval	Long oval	Short oval	Oblong shield
Prominence of Cheek-bones.	Medium	Rather marked	Medium	Medium	Medium

NOTE.

The tribe whose measurements are recorded in the foregoing pages have also been measured by Messrs. Annandale and Robinson, whose figures are given in detail in "Fasciculi Malayenses, Anthropology," Part I, pp. 105-149 (1903). As the measurements have been taken, which one exception, in precisely the same manner the results obtained are here given for comparative purposes, while in the third column both series have been combined, the number of observations, viz., 78, representing a very appreciable fraction of the total adult males of the tribe.

It will be noted that in those measurements that admit of a high degree of accuracy such as the length and breadth of the head and the length and breadth of the face, the two series show very close approximation, while in others, such as the height of the head from vertex to tragus, which are more difficult measurements to take, a considerable amount of divergence is exhibited.

The difference of bigonial breadths is due to the fact that in one instance an attempt was made to give the bony breadth of the face and in the other the fleshy breadth was recorded.

H.C.R.

EXTREMES AND MEANS OF TWO SERIES OF MEASUREMENTS OF SENOI FROM THE
BATANG PADANG DISTRICT, SOUTH PERAK.

	KLOSS.				ANNANDALE & ROBINSON.				COMBINED SERIES.			
	No. of Observations.	Highest.	Mean.	Lowest.	No. of Observations.	Highest.	Mean.	Lowest.	No. of Observations.	Highest.	Mean.	Lowest.
Height of Stature	44	1,698	1516.2	1,380	34	1,638	1524	1,411	78	1,698	1519.5	1,380
Girth of Chest	43	900	803.8	736	26	920	814	745	69	920	808.5	736
Vertex to Tragus	44	148	134.9	125	34	141	127	110	78	148	131.5	110
Length of Head	44	199	182.0	172	34	193	183	170	78	199	182.4	170
Breadth of Head	44	152	143.5	133	34	151	142	130	78	152	142.7	130
Length of Face	44	124	109.4	97	34	119	107	95	78	124	108.4	95
Breadth of Face	44	145	134.0	123	34	147	135	125	78	147	134.4	123
Bigonial Breadth	44	127	116.6	98	34	136	125	110	78	136	120.3	98
Length of Nose	44	55	45.6	39	33	50.7	43.7	37.5	77	55	44.6	37.5
Breadth of Nose	44	49	40.5	35	33	46	40.0	36.3	77	46	40.3	35
Interocular Breadth	44	42	33.5	30	34	42	33	26	78	42	33.3	26
Cephalic Index	44	85.2	78.7	71.1	34	82.6	78.3	73.4	78	85.2	78.5	71.1
Cephalic Height Index	44	83.1	74.5	67.6	34	78.1	70.4	60.5	78	83.1	72.7	60.5
Facial Index	44	96.7	81.9	73.5	34	88.2	79.3	73.1	78	96.7	81.7	73.1
Nasal Index	44	105.0	88.8	63.6	33	111.8	91.9	79.0	77	111.8	90.2	63.6



SAKAI OF JERAM KAWAN, SUNGKAI RIVER, PERAK.



Photos, I. H. N. Evans.

SAKAI VILLAGE OF UNKUN, SUNGKAI RIVER, PERAK.



Photo, I. H. N. Evans.

SAKAI OF ULU SUNGKAI, PERAK.



SAKAI OF ULU SINGKAI, PERAK.

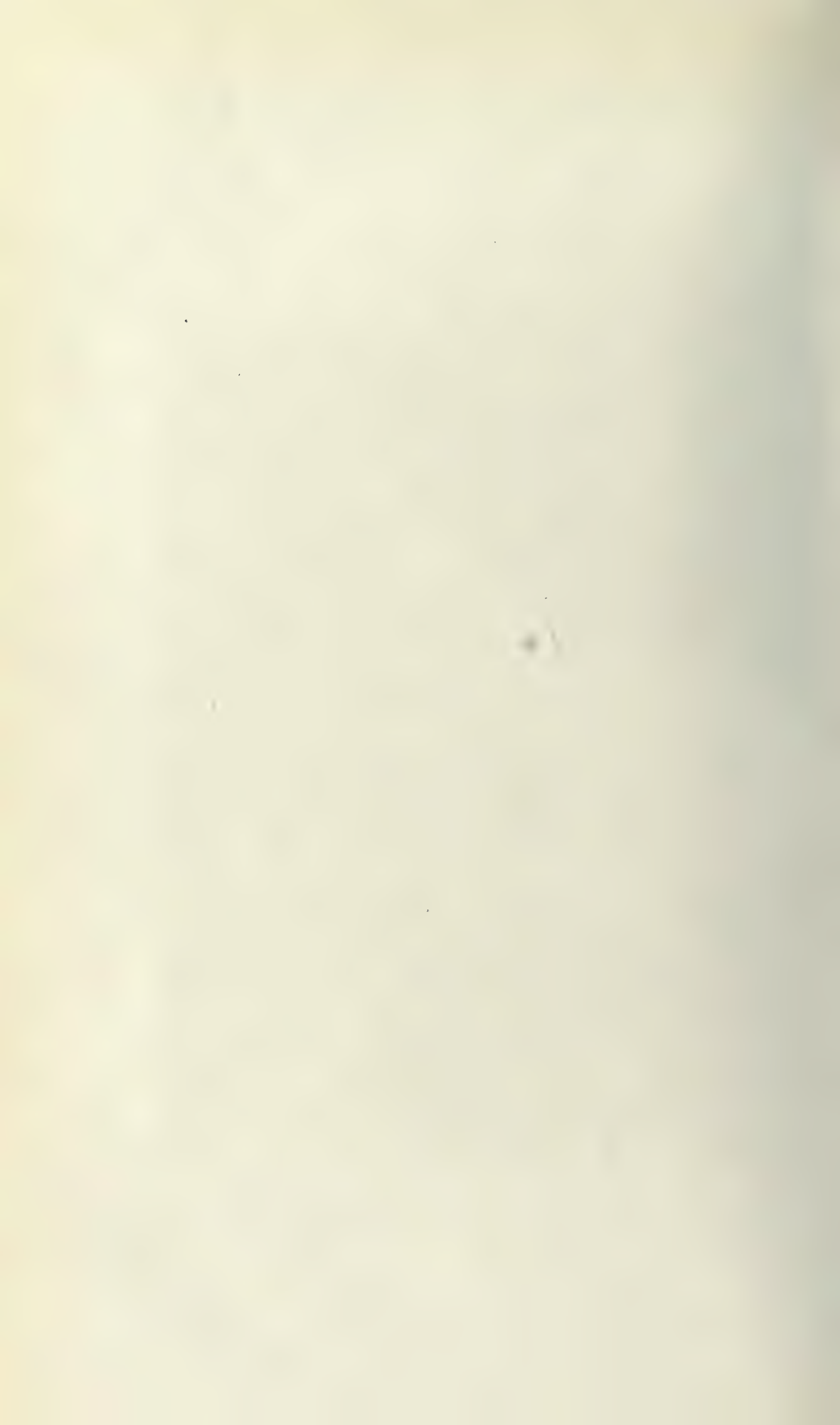
Photo, L. H. N. Evans.

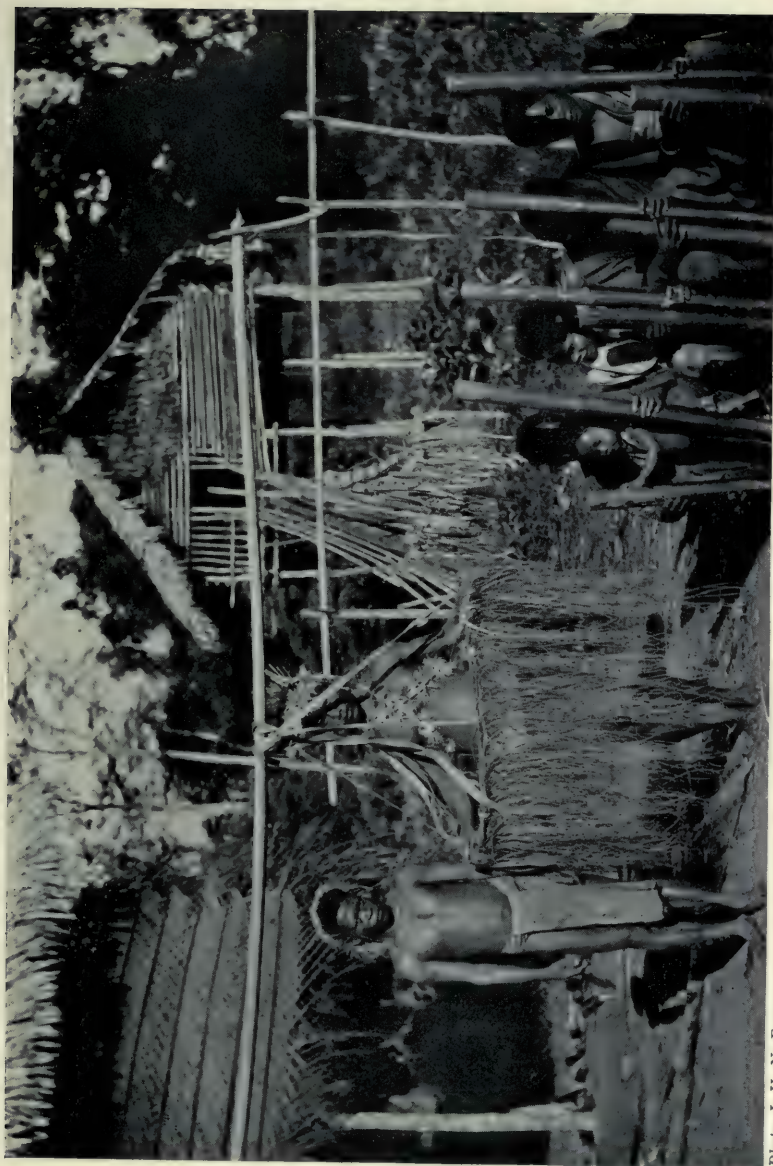




Photo, I. H. N. Evans.

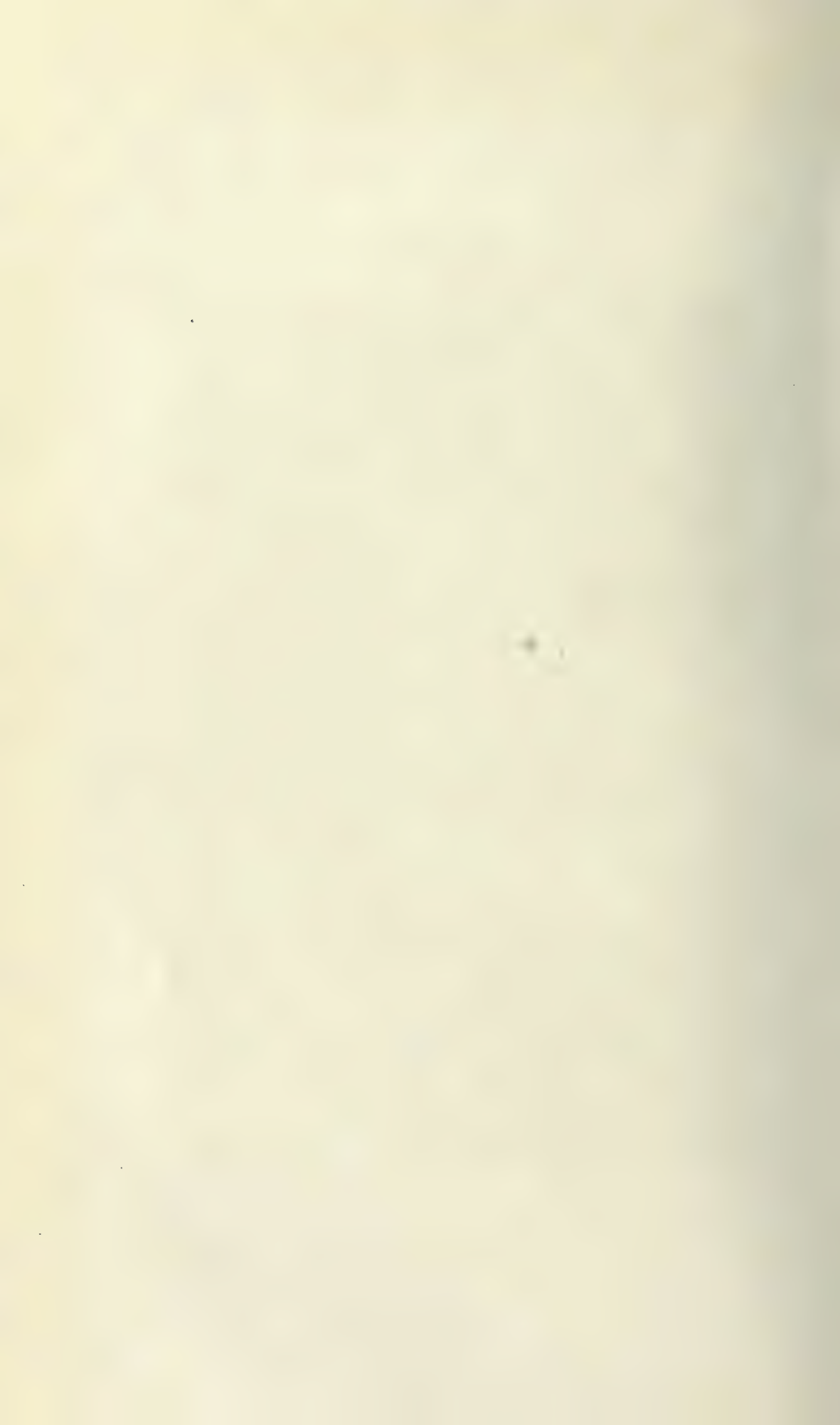
SAKAI OF ULU SINGKAI, PERAK.





Photo, I. H. N. Evans.

HALAK'S PERFORMANCE AT UNGKUN, SUNKAI RIVER, PERAK.



X. NOTES ON THE SAKAI
OF THE ULU SUNGKAI IN THE BATANG
PADANG DISTRICT OF PERAK. (Pls. XXIV—XXVIII.)

By IVOR H. N. EVANS, *Assistant Curator*
and *Ethnographical Assistant F.M.S. Museums.*

In April, 1914, I paid a visit of about a fortnight's duration to Jeram Kawan, a rapid in the Sungkai river about eight or nine miles by boat from Sungkai village. A Malay settlement had recently been made on the bank of the river just below the rapid, the clearings at the time of my visit being only about three or four months old. Close by on the opposite bank was a single Sakai house standing in a considerable clearing which was planted with Indian corn, and it was from the inhabitants of this house that I obtained a good deal of the information embodied in the present paper. I took up my quarters in the hut of an old Malay named Hassan, who was employed by a Sungkai Chinaman to barter goods with the Sakai in exchange for rattans, and I was thus enabled to get into touch with aborigines from many up-country settlements, who came in to dispose of heavy bundles of cane. About a quarter of an hour's walk from the Malay clearing, and on the same side of the river, is a hot spring, the waters of which are strongly impregnated with sulphur, and to this, in dry weather, big game, chiefly seladang and deer, come in numbers to lick up the sulphur deposit. I mention the spring as I shall have occasion to refer to it later in connection with a Sakai folk-tale.

The Central Sakai of Batang Padang have been more measured and described than any other tribe in the Peninsula, and I therefore thought it better, with the exception of taking some photographs, to devote myself as much as possible to finding out what I could of Sakai folk-lore and beliefs.

Before turning to other subjects I should like to say a word of warning against accepting aborigines who may live in a certain district as necessarily truly belonging to it. The amount of shuffling and re-shuffling among aboriginal tribes has often been extraordinarily complex. Some of the various causes which have contributed to this admixture of tribes, and even of races in the Malay Peninsula are; pressure of alien populations (Malays, Siamese, Chinese, etc.), slave raiding expeditions by Malays before the country came under British control, especially by Sumatran Malays, Rawa and Mendiling people, in Selangor, Negri Sembilan, and Pahang; the escape or liberation of slaves who had been sold into another country, and on regaining their freedom reverted to jungle living, often forming small villages of their own, and taking wives from among the aborigines of the country: and the wandering habits

of certain tribes, notably in Pahang, who undertake long journeys in search of jungle produce or for other reasons.

All the up-country people who came down to Jeram Kawan seemed to be typical Senoi (Central Sakai), the purest tribe of Sakai in the Peninsula. They had the somewhat long and lean type of face with an often almost delicate nose, the straight eyes without any trace of the Mongolian fold, and the long wavy hair so characteristic of the true Sakai. On the other hand, of the three males in the house at Jeram Kawan, two presented features which led me at once to suspect the presence of Negrito blood, though their skin colour was scarcely darker than that of many of the up-country Sakai. (pl. XXIV) These two individuals were brothers and the faces of both were of the round and rather childish type so commonly seen among the Pangan and Semang, which contrasts very strongly with the long, serious-looking face of the pure Sakai type. On making further enquiries they told me that their father had been a Mai Pahang (Pahang man), and that he had come from somewhere in the Lipis district. As it is well known that there are a few wandering families of Pangan in this neighbourhood it is extremely likely that their father was a negrito.

Besides the settlement at Jeram Kawan there is another aboriginal village, Ungkun, (pl. XXIV) on the river between that place and Sungkai. Here again the community is decidedly mixed, the villagers being the descendants of slaves, aborigines of Selangor, who were sold into Perak by Rawa and Mendiling raiders, and on gaining their liberty formed alliances with Senoi women and settled down comparatively close to the Malay villages.

I brought two boys from this kampong back with me to Taiping, and on talking about the different Sakai settlements with them, they informed me that they could scarcely understand the people of the up-country villages at all, while though they understood, pretty well, the dialect talked by the people of the Jeram Kawan settlement, they (the J. K. Sakai) occasionally used words which they did not know; so apparently the dialect of the Sungkai settlement is a sort of bastard Senoi-Sakai. The Jeram Kawan people, from whom, as remarked above, I obtained much of my information, are evidently more akin in language and customs to the true Senoi than the people of the down-stream settlement.

GENERAL REMARKS ON THE SUNGKAI ABORIGINES.—(Pls. XXV—XXVII).

All the aborigines I met with called themselves Senoi and though they recognised the term Mai Darat * they said that it

* If this is so it is rather extraordinary as Mai is a Sakai word meaning people. Possibly the truth is that some other section of the Central Sakai use the term as their tribal name.

was applied to them by the Malays. The general appearance, habitations, dress, manufactures, and mode of life of the Senoi have been so frequently described that I think it unnecessary to record at length any observations on these matters, unless I believe them to be new or at variance with the accounts of other observers.

Face painting was seen on several of the women, the pigment being obtained from charcoal, or the face was marked with saliva coloured by sireh chewing.

Tattooing was observed on only three individuals. One of these had a design over the right breast, which apparently was meant to represent some kind of animal, but he informed me that it had been done by a Chinaman. Of the other two, one had a series of vertical lines tattooed on the forehead, and the other a single line reaching from the top of the forehead to the tip of the nose. Both these men told me that tattooing had been known to their ancestors for many generations and they further got for me some thorns of the "rotan dudok," the implements with which they said the colouring matter, charcoal, was pricked in. I handled the heads of both my informants, so, in addition to the information they gave me there was no possibility of my mistaking face painting for tattooing. In the case of the man with the single line down the nose, a good deal of colouring matter seemed to have been forced in, as the skin over the markings was slightly raised above the level of the adjacent parts. Several of the men who came from up-country had the septum of the nose bored for a nose stick, (Pl. XXVI) and ear-boring for the insertion of small Malay-pattern ear-studs or large bamboo ear-plugs was universal among the women. Unfinished cigarette ends were often carried in these holes in the ear-bole, or were placed behind the ear. Both men and women have the front teeth in the upper and lower jaws filed down. With regard to the blow-pipes of the Sungkai people, a long and short variety were seen, and long and short darts were used in them accordingly. The measurement for a long dart is from the point of the elbow to the tip of the little finger, and for a short one from the point of the elbow to the wrist. Two types of dart quiver were seen, one with a large, hard, round and almost flat cover of finely shredded and closely woven rattan cane, the other with the soft bag-like cover of plaited pandanus leaf, which is typical of the Central Sakai. I was told that the rattan covers were made by the men, and those of pandanus by the women.

The only clothing worn by most of the men from up-country was a simple T bandage of terap bark-cloth, which was often so small that it did not suffice to properly cover the genitals. Remarks on the scantiness of the loin-cloth among the Central-Sakai have however already been made in the "Fasciculi Malayenses" of Messrs. Annandale and Robinson. All the Senoi I met were able to talk fluent Malay, though some of them spoke with a harsh and jerky intonation.

SENOI NAMES.

Names are, I believe, generally given by the midwife. The prefix Yok before a name signifies a man, and Han a woman. When a married couple have had a child they are frequently not called by their own names, but are simply known as father (*Bek*) or mother (*Ken*) of so-and-so. Several examples of this will be found in the attached list of names of some of the Sakai I met at Jeram Kawan. The custom is common throughout Malaysia.

Males.

- | | |
|--------------------------------------|-------------------------------------|
| (1) Yok Simbok. | (7) Yok Integ. |
| (2) Yok Dalam. | (8) Yok Angong. |
| (3) Yok Pataling (or
Bek Landas). | (9) Yok Batiwou (or
Bek Sunyap.) |
| (4) Yok Tangkop. | (10) Yok Gok (or Bek
Kidai.) |
| (5) Yok Jahaia. | (11) Yok Intan. |
| (6) Yok Sagop. | |

Females.

- | | |
|-------------------------------|----------|
| Han Gamak (or
Ken Landas.) | Han Un. |
| Han Landas. | Han Yok. |

FOLK STORIES, RELIGION, AND SUPERSTITIONS.

The following folk stories were obtained from Yok Pataling, one of the Senoi of Jeram Kawan. They were told in a very disjointed fashion, important details being often omitted at first, and only coming to light after considerable questioning. I have however tried in translating to preserve the narrator's words as nearly as possible.

THE ORANG MENSUD.

The Senoi used to be attacked by a race of men called *Mai Mensud** (Mensud men) who came from Pahang. These had hair all over their bodies, arms, and legs. They used to come into people's houses and after feeding there (as guests,) seize some of the inhabitants in their arms, as they were squatting round the fire, and fly off with them to the mountains. After travelling for some time they used to come to a great marsh called Paya Lekut (The sticky marsh: lekut=Malay lekat.) Here they told their prisoners to sit down and rest, and when they did so, they seized them and threw them into the middle of the swamp. As soon as the prisoners had sunk into the marsh there arose from its surface spears, parangs (working knives,) adze heads, and blow-pipes. These the Orang Mensud collected and took home with them. If the Orang Mensud seized children they sold them as slaves. Sometimes a Mensud man used to take a *Halak* (magician) with him and go to a cave. They placed a little *Kijar*† near

* The Mensud and Temir rivers on which they were said to live were stated to be tributaries of the Bertang river in the Ulu Jelai district of Pahang.

† A kind of damar gum.

the mouth of the cave, and a snake came out of the hole, smelt the *Kijar*, and then went back again. After this dollars and beads appeared from out of the cave. These they gathered up, and then went home.

I was told that one man named Bek Jawil, who was still alive, had been seized by the "Orang Mensud" about three years ago, but had managed to make his escape.

LEGENDS OF THE ECLIPSE OF THE MOON.

I was fortunate enough to obtain two legends which differ considerably in details, but which both profess to account for the lunar eclipse: they were told to me by Yok Pataling, and are as follows:—

LEGEND I.

When the moon is quenched it falls to the earth. Presently a *Halak* (magician),—always the same man,—comes to the place where the moon has fallen to the earth and asks; "What are you doing there?" The Moon replies: "I have fallen down. I came down to get food for my children the stars. If you don't help me to get back again to the sky all you men upon the earth will die." "Wait," says the *Halak*, and, as it is night, he goes to sleep. While he is asleep his familiar spirit (*Anak Yang*) comes to him and says, "Help the moon to get back or all men will die." "How can I help the moon to get back," says the *Halak*; "I cannot do it." "Get ready a *bumbun*" (a round hut made of large leaves), says the *Anak Yang*. So the *Halak* calls together his people and they prepare the *bumbun* and make music with bamboo stampers (*berchetog*: Malay, *berchentong*) and go through magical rites (*berjualak*) there for seven days and seven nights, calling on the *Anak Yang* to help them to get the moon back to the sky. At the end of this time the *Anak Yang* puts the moon back again.

LEGEND II.

The sun is angry with the moon because of an old quarrel. Formerly both the sun and the moon had many children, but the moon said to the sun, "Men cannot stand the heat of your children. If you will eat your children, I will eat mine." So the sun ate his children, but the moon hid hers (the stars) and afterwards producing them refused to carry out her part of the bargain. So that is why the sun is angry with the moon and fights her whenever they meet.

When an eclipse occurs I was told that the Senoi call out

O Rahu* perjuk gecek jik!
Jik mong kulit dunia!

* c. f. Ulu Bertang Sakais' beliefs. Skeat's *Pagan Races* Vol. II, p. 235. According to Thompson (*Lotus Land* p. 130) Pra Rahoo is the Siamese deity who tries to swallow the moon and sun, thus causing solar or lunar eclipses.

See also Wilkinson's *Malay Dictionary* "rahu."

which means

O sky, give me back my moon!

I am still upon the crust of the world!

The Senoi are very much afraid of thunder and lightning, and certain actions which are thought to bring about bad storms are tabu. If a person offends against one of these tabus it is considered necessary to take precautions to avoid the evil consequences of the infringement, otherwise the house of the transgressor will be struck by lightning and everyone in it killed. The tabus of this kind which I collected are given below.

It is tabu to—

- (1) take a jungle leech off the body and put it into the fire.
- (2) put *malau* (a kind of gum) into the fire.
- (3) tease a cat or dog in the house.
- (4) tease a tame monkey or dress it up like a man and laugh at its antics.

If a child breaks the tabus relating to cats, dogs, or monkeys and a storm comes up soon after, its mother cuts off some hair from its head, wraps it up in a piece of thatch and, going out of the house, places the parcel of hair on the ground and strikes it with a parang or a billet of wood. Up-country Senoi were also said to cut a piece of hair from a friend's head, place it on the ground and strike it with a parang, whenever a thunder storm overtook them in the jungle.

The hot springs near Jeram Kawan are thought to have arisen owing to the infraction of a storm tabu by some Sakai many generations ago, and the Senoi told me the following legend about them.

THE LEGEND OF THE HOT SPRINGS.

Long ago a man who had three wives, all sisters, lived on the present site of the hot springs. He was a *Halak*. One day he shot a brok monkey* with his blowpipe and was just going to roast it when his father-in-law came to his house and seeing the monkey said "If you want to keep my daughters with you and are really a *Halak* don't roast that monkey but bring it to life again." For a long time the *Halak* refused but as his father-in-law insisted on it he at last went and pulled the poisoned dart out of the monkey and drew the poison out of the wound with his fingers. Then the monkey came to life again, and they dressed him in coat and trousers and gave him a sword, and he danced (*bersilat*) on the ground outside the house.

After a time the *Halak* wanted to stop the monkey dancing and said to his father-in-law, "that is enough," but his father-in-law, who was much amused, told him to let it con-

* *Macaca nemestrina*.

tinue. After the performance had gone on for some time, the father-in-law, two of the *Halak's* wives, and the people who had come together to see the sport, all laughing at the monkey, the *Halak* got ready his carrying basket and going into his house to the wife of whom he was fondest, and who had not gone outside to see the monkey dance, or laughed at it, he rubbed her between his hands, and she became a pebble, which he put into his carrying basket. Then he lay down on his mat as if he were going to sleep. When his father-in-law, his two wives and the rest of the people stopped laughing at the monkey, there immediately arose a great thunder-storm, and as soon as this began the *Halak*, taking his basket, came down from the house, and went off into the jungle, leaving his other two wives, his father-in-law and the rest of the people behind him. Thereupon his house was struck by lightning and his father-in-law and the people who had come to watch the monkey were all killed. As for the *Halak* he fought the lightning (*chilou*) stabbing at it with his spear while his familiar spirit (*Anak Yang*) helped him by biting at it. At last the *Halak* finding that he could not win the fight, ran off into the jungle and escaped. The two wives whom the *Halak* had left behind at the house were not struck by lightning and ran away to Bukit Ubai Baleh (The Maiden's Hill.) Here they saw something which looked like a big tree-root, but which was really a dragon, so, plucking some *bertam* fruits, they put them on the "root" and cut them open with a parang. When they had done this they were immediately drawn in under the "root" (the dragon's body) and died. The dragon has now become a stone and can still be seen on the side of the hill, and the two wives' dresses of leaves also became smaller stones, and lie near the dragon's body.

The Senoi have many charms and incantations for stopping or warding off thunder-storms. Those I was able to collect are given below.

(i) To try and stop a storm which has already begun, a man will call out

Gar ingar, eng sengoh.
Don't thunder (?) I am frightened.

(ii) For the same purpose

Poie sur! Chongkajok!
Chongburbur!
Sur kinjok nor laut!
Go wind! Creepers and Rattans! Go clouds to the sea!

(iii) For the same purpose

Brou gek-gek-gek!
S'lak berjut!
S'lak n'rik!
Srek asut!
Stop a little!

Leaves of the *berjut*! (a kind of creeper).
 Leaves of the *chapa*! (*Blumea balsamifera*).
 Stop (?) altogether! (*asut* means dry).

- (iv) For the same purpose

Lors pateh-ge!
 Go back there! (The Malay, *Balik ka' sana*).

After repeating this the face is turned towards the direction from which the storm comes, the right hand is put in front of the mouth, trumpet fashion, and blown through "Puah," the hand, almost at the same moment, being sharply moved away from the mouth in a horizontal direction for a couple of feet and the fingers opened. This may also be done after repeating any other of the charms.

- (v) To be used when thunder is heard coming up in the distance.

Garoh, Garoh, Garoh! (supposed to represent the sound of thunder).
 Sa'hari ini kamaru!
 Sa'hari esok pek jadi!

Which means

Let the weather be hot to-day
 and don't let it rain to-morrow.
 (Literally—To-day hot weather. To-morrow don't let it become (rainy).

This charm is of course almost entirely in the Malay language, the only Sakai word being *pek*. A somewhat different version was given as well and I reproduce it here though I could not get its full meaning.

- (vi) Garoh, Garoh, Garoh.

Makoh menrit pek jadi.
 (*Makoh* was said to mean pregnant).

- (vii) Used when the sound of coming rain is heard by people on a journey in the jungle.

Orang sini gulai kaladi.
 Orang sana gulai tapah.
 Orang sini jangan jadi.
 Orang sana biar basah.

This charm again is entirely Malay and means

The people here eat curried kaladi.
 The people there eat curried tapah (a kind of fish).
 Don't let it rain on the people here.
 It does not matter if the people over there get wet.

According to the Senoi, when there comes a shower followed by sunshine, the rainbow springs up from a place where a tiger has been sick.

VARIOUS BELIEFS AND TABUS.

Most of the following tabus are I believe not in force among the people of the settlement near Sungkai, and are less rigidly adhered to at Jeram Kawan than among the up-country Senoi.

(i) Women and children may not eat, cook, or touch deer's flesh, or go near the body of a dead deer.*

(ii) They are also prohibited from eating the flesh of the following animals.

The Sēladang (*Bos gaurus*)

The Brok Monkey (*Macaca nemestrina*)

The Krah Monkey (*Macaca fascicularis*)

The Menturun Raya or Benturong (*Arctictis binturong*)

(iii) The flesh of elephants may not be eaten by the Senoi of Sungkai under any circumstances. It was said that anyone who broke the tabu would fall ill and die.

(iv) Some people consider it tabu to tell their own names.

(v) It is tabu to strike a parang (working knife) into an old tree stump in a clearing and leave it sticking there. This action would disturb the earth spirit and cause plagues of rats or insects.

(vi) If a man drops a piece of food and says "Peninah," which is a curse, he considers that the food is tabu to him and will not pick it up and eat it. To do so would be to court dysentery.

The existence of one rather interesting tabu, which I believe is also kept by local Malays, I found out in the following way. Yok'Dalam, the headman of the Jeram Kawan people, had the misfortune to fall from a tree and bruise himself very badly. It appears that a message was sent to the settlement near Sungkai asking that any women who were skilled in medicine should come to Jeram Kawan to treat him. On the day after the accident I was sitting outside the hut in which I was staying, when three Sakai women and two youths went by, evidently on their way to Jeram Kawan, walking quickly in single file. As I was acquainted with two of the party I called out and asked them if they were going to treat Yok Dalam, but was rather surprised to get no answer. On thinking for a minute I concluded that there was probably a tabu against speaking binding on persons going to treat a sick man, and on subsequent enquiry I found my surmise to be correct.

Another rather curious little observance came to light owing to the same accident. One of the Sakai, after telling me how Yok Dalam had fallen down, said that his companions

* The infringement of any of these tabus is said to bring convulsions on the head of the guilty party.

had made a bed of leaves for him so that he might rest until he had recovered a little, and had then taken repeated strides backwards and forwards over his body. Asked why this was done my informant said that he did not know, except that it was customary to do so when a man fell from a tree, and that the action was supposed to help the patient to recover.

The reason of Yok Dalam's misfortune was thought to have been because he left the house without chewing sireh, as he had wanted to do, but being in a hurry had put it off. On account of this he was said to have been stricken by "*Punan*" (kena Punan), it being considered particularly unlucky to go out into the jungle with any craving unsatisfied. This belief according to Hassan is also current among the local Malays. There is a Malay word *Kempunan* meaning "a dilemma or difficulty caused by every course open to one having its disastrous features" (Wilkinson's Dictionary), which very probably has some relation to the *punan* of the Sakai.

RELIGION.

The Sakai seem to have very few definite religious beliefs, but they have a supreme God, Yenang, whom they say corresponds to the Tuhan Allah of the Malays. The following legend gives some details about Yenang and the Sakai after-life, though I am inclined to think that the greater part of it may have been borrowed from the Malays, and slightly adapted to suit Sakai ideas.

"The souls of Senoi leave their bodies, before they actually die, by the whorl of hair at the back of the head (*ruai*.) The soul passes to the west and tries to get into heaven (*Surga*, Malay) by the gate by which the souls of Malays enter. This it cannot do, so it goes round by another way until it comes to a large iron cauldron (*kawah*) full of hot water. This is spanned by a bridge called *Menteg* (meaning unknown to Yok Pataling, who told me the story) which looks like a tree trunk from which the bark has been removed. Below the iron cauldron there is a great fire. The souls of little children pass safely over the bridge for they are without fault, but those of full grown people fall into the cauldron of hot water. Yenang takes these souls from the cauldron and plunges them into the fire until they are reduced to powder. Then he weighs them in a pair of scales and if they weigh lightly he passes them over into heaven, but if they are heavy he puts them into the fire again until they are sufficiently purified.

BURIAL CUSTOMS.

I had no opportunity of visiting any Sakai graves, but I made a good many enquiries about burial customs, and about the haunting of the grave by evil spirits. The results of my questioning are as follows.

The body of a dead person is buried lying on the left side with the head towards the west and the face looking north.

To make a grave a rectangular pit is dug to a depth of a man's breast and a cave-like excavation sufficient to contain the body is then made in one side of it. The corpse, which is wrapped in mats, is put into this, and the mouth of it closed up by driving stakes into the bottom of the pit and stretching a sheet of tree bark between the stakes and the mouth of the burial niche. The hole is then filled in and the deceased's belongings and food and tobacco placed on the top of the grave.

[This information was obtained from Yok Pataling, but one of the youths of the Ungkun settlement, whom I brought to Taiping, afterwards contradicted the statements about the position in burial saying that the corpse was put on its back with its head pointing to the east. Possibly different customs may prevail among the Ungkun people.]

For the first five days after burial, food is placed on the grave every day, and for six days numbers of evil spirits are thought to collect at the grave of the deceased and feast. During that period children are not allowed to go out after dark.

The following information, obtained from Yok Pataling, is somewhat "jumbled" but I found it impossible to obtain a clearer account.

An evil spirit in the appearance of the dead person, (apparently not the actual soul or spirit of the deceased) haunts the grave. It has its face turned backwards on its body and its eyes are rolled upwards till only the whites are visible. When an evil spirit of this kind catches hold of a human being the part touched withers. If a *Halak* dreams that there is an evil spirit at a grave, his *Anak Yang* coming to him in the dream and telling him, he goes to the grave with his *Anak Yang* and hiding behind a tree watches the evil spirit feasting with the companions he has called together. Now the evil spirit's companions are chiefly spirits whom the *Halak* has already conquered and who are afraid of him. After watching for a time the *Halak* and his *Anak Yang* rush out and the latter seizes the spirit while the *Halak* stabs it with a bamboo spear. When the *Halak* stabs the spirit the other ghosts all vanish, being frightened of the *Halak*, and immediately the mouth of the grave opens and the spirit jumps into it, pursued by the *Halak* and the *Anak Yang*. The spirit runs away into the earth. The *Halak* and the *Anak Yang* go to the corpse, and the *Halak* strokes its face to see that all is well. Then the bottom of the grave opens below them and they find their way to heaven (*Surga*), passing over the bridge called *Menteg*. After this the *Halak* returns to earth by some unknown road. When he has got back to the earth he makes a medicine hut (*bumbun*) and decorates it with sweet smelling flowers, *lebak* leaves and long bamboo water-vessels decorated with patterns and full of water. When night comes he performs magical rites (*berjualak*) and in the early morning the

spirit whom he wounded comes outside and hurls the spear with which he was stabbed through the wall of the *bumbun*. The *Halak* seizes the spear and then goes to sleep and whatever offerings the spirit asks of him in his dreams such as *bras kunyet*,* or soaked rice in the husk, he throws out of the hut into the jungle. The spirit takes the *bras kunyet* and the soaked rice (*bertis*) and throws back a few grains as a sign that he wishes to be friendly with the *Halak*. So after this the spirit becomes the *Halak*'s friend and helps him to cure sick people and in other ways.

THE HALAK.

I obtained the following further details about *Halaks* and their attributes, which I may as well give here.

(i) The *Halak* is said not to be buried in the earth. Instead of this his body is placed in a round hut (*bumbun*) and left there. Two or three days after death the body vanishes from the hut.

(ii) The spirit of a dead *Halak* becomes a *B'lian* or were-tiger.

(iii) The last of the great *Halaks* in the Sungkai district, a man named Bekoh, is said to have died about five years ago. Since then, though there are several men who are supposed to have a little knowledge, there has been no one to succeed him. Old Hassan, the Malay, declared that he had seen Bekoh, when possessed, grow a large pair of canine teeth (*taring*) three or four inches long. These on Bekoh's command he had taken hold and shaken in order to prove that they were genuine. Jahaia, headman of the settlement between Jeram Kawan and Sungkai, makes some pretence to being a *Halak* and is supposed to have a familiar spirit which descended to him from his father, but he can scarcely be counted a Senoi, as his father was a Malay-speaking Selangor aborigine and his mother I believe half Senoi half "Mai Selangor." I will however describe a performance seen at Jahaia's kampong later on.

SENOI OATHS.

If a Sakai wishes to take an oath he swears by the sun. This I found out in the following manner. While I was at Sungkai a dog of Yok Pataling's chased and slightly bit a goat belonging to a Malay. This was, the Malay thought, too good a chance of imposing on a Sakai to be let slip, so he started "dunning" Yok Pataling for seven dollars cash as compensation, or demanded in lieu thereof that he should come and work for him for several days. Hassan, the rattan gatherer, told me about the affair and I called Yok Pataling and asked him if the goat was badly damaged. He replied, that the wound was little more than a scratch. "Very well," I said, "you go and tell this Malay that if he considers he has

* Rice coloured with turmeric.

any claim on you for damage to his goat he is to come and see me about it." Yok Pataling went off at once and gave the Malay my message, whereupon the latter immediately changed his tone and said that he had only been joking and that Yok Pataling did not owe him anything, at the same time upbraiding him very bitterly for having gone and informed the "Tuan." To this Yok Pataling replied "I swear by the sun that I did not tell the "Tuan," and if I lie, may the sun shrivel up my tongue."

BIRTH CUSTOMS.

My informants with regard to birth customs were two Jeram Kawan Sakai. The information obtained from them is given below.

The expectant mother is isolated in a small hut of leaves built on the ground not far from her own house, it being tabu for a birth to take place in an ordinary dwelling. Here she is attended by the midwife, and after the child has been born she goes through a three days purification ceremony in the hut, bathing under a decorated bamboo spout into which water is poured from a long water bamboo. When the purification is over the mother returns to her own house and the midwife ceases attendance. No fish or chilies may be eaten by a woman for two months after she has given birth to a child, and salt and the cabbages of all palm trees which have thorny stems are forbidden for several days. The midwife must be present and eat with a woman when she takes fish or flesh with her rice (*makan berlauk*) for the first time after her delivery. A similar heating treatment to that employed by the Malays, is undergone by Sakai women after their confinement.

HALAK'S PERFORMANCE AT UNGKUN.*

While stopping at Jeram Kawan I arranged with Jahaia, the headman of the down-stream settlement, Ungkun, to hold a magical performance on the night of May 26th. I left Jeram Kawan by boat at about 3 p.m. and arrived at Jahaia's kampong, where I was to sleep that night, some time before dark. Here I found the women busy cutting up and plaiting leaves which were to form the ceremonial decorations and getting ready the bamboo stampers with which an accompaniment is played to the *Halak's* chants. Jahaia was becomingly modest and said that he would do his best though he could not claim to be a proper *Halak*, and only knew how to perform a little. Some time after dark the sound of the bamboo stampers from a neighbouring house announced that the performance was about to begin. Making my way to this, and up the tall ladder, I found the hut crowded by the inhabitants of the whole settlement, who were engaged in chattering, sireh chewing, and slapping their bodies in order to

* See photo Pl. XXVIII taken outside the house on the morning after the performance.

obtain some relief from the swarms of sandflies which infested the village. The *Halak's* apparatus consisted of a circular frame of rattan cane, with a diameter of about four feet, hung all round with a fringe of *bertam* leaves cut into strips about 3 ft. long. This frame was suspended at a distance of about 4 ft. from the floor, the ends of the hangings thus being about 6 ins. from it. The frame was held in position by three strips of tree-bark, which were attached to it at regular intervals, and were all tied together to a roof beam of the house. Close to the frame, and about 5 ft. above it, was hung one of the ceremonial offering trays (*anchak*) which are used both by Malays and aborigines. This was decorated with ceremonial hangings of cut and plaited leaves and the scented inner bark of some tree. At the side of the hut was tied a sheaf of the large leaves of the *salak* palm (*Zalacca edulis*). Jahaia reserved his exhibition till late in the evening and the first performer was a youth who I was given to understand did not possess a familiar spirit, but hoped possibly to cultivate one in time. He wore a loin cloth round his waist and on his head a wreath of shredded leaves, studded with flowers, which had a sort of ornamental brush of stiff leaves standing up from it at the back. Two garlands of cut leaves on a foundation of tree-bark were worn crossed over his chest and in his hand he carried a switch of *lebak* leaves. He took up a squatting position on the floor within the circle of the hangings attached to the rattan frame, and another young man, wearing a wreath of flowers on his head, also entered the circle as his assistant. When the hut had been plunged into semi-darkness by tying up *salak* leaves in front of a lamp hung near the door, the women, with a bamboo stamper in either hand, took places behind a log of wood which had been placed near one side of the hut. The young *Halak* then commenced a chant in a Sakai dialect, each line being taken up and repeated by his assistant and an accompaniment played by the women with their stampers on the log of wood. Every time the *Halak* raised his voice he brought the switch of *lebak* leaves smartly down on the palm of his left and he also frequently flourished it over his right shoulder. The chant was, I understand, an invocation to an *Anak Yang* to come and obey his commands. Presently two or three other youths came and crouched under the circle of hanging leaves, those who could not get entirely inside it managing at any rate to squeeze in their heads and shoulders. After the performance had gone on for some time it was brought to a close, and Jahaia with a single assistant took his place within the circle. Jahaia, having inherited his familiar spirit from his father who, as mentioned above, was a Malay-speaking Selangor aborigine, proceeded to call upon it in Malay. His chant was taken up by his assistant and the women who were beating time with the stampers, and after a while a Sakai who was squatting next to me told me that the *Anak Yang* had come. Jahaia then stood up and grasping the circular rattan frame in his

hands told it to dip towards myself, which it immediately did,—not a very wonderful thing, as Jahaia had hold of it on each side of his body. After this I left the hut as it was 2 a.m. and I was told that the rest of the performance would be similar to that which had already taken place. I was unfortunately unable to catch sufficient of the chant to be able to write it down, but I heard “*mari ka' ujong jalan* (come to the end of the path) frequently repeated and from what I could make out of the rest it seemed to be a prayer to the *Anak Yang* to come to Jahaia. I have since been told by the two boys I brought home with me that there is another man in the village who has a better claim to be considered a *Halak* than Jahaia. He was able, they said, by the help of his familiar spirit,—and they had seen him themselves do it,—to split a large section of bamboo without touching it, and they described how his *Anak Yang* was heard to enter the bamboo with a noise like *crik-crik-crik*, the bamboo splitting into two pieces, with a loud report, a few minutes afterwards. He was also able to grow large eye-teeth, *taring*, out of the corners of his mouth, and between his first and second fingers. Yok Tong, the elder of the two boys, told me that the *Halak* had once caught hold of his head with the teeth between his fingers. Another of his accomplishments was to turn himself into a tiger,—he had been seen to do this by Yok Tong's sister,—and to go off into the jungle in search of game. Perhaps I may be able to return to Sungkai at some future date and investigate these remarkable performances for myself. I had heard before at Jeram Kawan that Sakai *Halaks* were able to split open bamboos as described, but it would be worth-while to see if a *Halak* can be got to undertake to do it for a suitable reward.



Photo, I. H. N. Evans.

JAKUN OF PERTANG, NEGRI SEMBILAN.



JAKUN OF SERTING, NEGRI SEMBILAN.



Photos, I. H. N. Evans.

JAKUN OF JOHOL, NEGRI SEMBILAN.

XI. NOTES ON VARIOUS ABORIGINAL TRIBES OF NEGRI SEMBILAN (Plates XXIX—XXX).

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Ethnographical Assistant F.M.S. Museums.*

These notes were made during a Museum expedition to Negri Sembilan at the beginning of 1914. Aborigines were found at the following places, Pertang in the State of Jelevu, Bahau on the railway line to Pahang, and Kelapi, an aboriginal village about two miles from Kampong Inas. The trip did not yield any objects of great ethnographical interest, but this was only to be expected, since none of these people are now distinguishable in dress and belongings from the local Malays. From only one of the tribes visited was a vocabulary other than Malay obtained, namely, from a few Serting River aborigines seen at Bahau, whose speech was essentially similar to that of the mixed peoples of S. Pahang. The most interesting result of the expedition was some information with regard to certain beliefs about the shamanistic practices of the Serting tribe, and a little information concerning the appeasing of the evil spirits of the jungle, got both from the Serting and the Pertang groups.

THE JAKUNS* OF TITI RAMEI, PERTANG (Pl. XXIX).

Thanks to the kindness of Mr. T. R. Hubback, of Pertang the writer was enabled to spend a few days in this locality, and to get into touch with sections of two tribes of aborigines. One of these small parties had a couple of huts in a clearing close to the place where the Pertang River crosses the Ayer Baning bridle path, the spot where their houses were situated being called Titi Ramei (Populous bridge). Two visits were paid to these people, and in addition some of them came up twice to Mr. Hubback's bungalow. They are a Malay speaking tribe, but they seem to use a few non-Malayan words, and their speech is rather a rude dialect. To the Malays they are known as Sakai (a term applied to most aboriginal tribes) Berenyup or Renyup, the latter apparently because of their constantly using the expression "*nyup*," (there is not, *tid'ada*), but the name they apply to themselves, is Orang Lapan (men of the plains). Their houses resemble those of the poorer class of Malay peasants, as do also their household utensils and their clothes. At the time of our visit a number of the people were away in the jungle at some durian groves, there

* For the sake of convenience throughout these papers the aborigines are referred to as Jakuns, for though there may be some small admixture of Sakai blood in them, and one tribe speaks a Sakai dialect, their physical characteristics are those of Proto-Malays.

being only four fully grown men left at home. These were all brothers, and sons of a very old woman, who said that she had thirteen children, of whom six males and two females still survived. The clearing in which the houses stood was planted with tapioca and keladi, but neither of these were sufficiently advanced to be used as food. Until the crop ripened the Jakuns were living by cutting rattans in the jungle and selling them to the Chinese storekeepers at Pertang, supplementing the rice which they were thus enabled to purchase with whatever animals they could shoot with their blow pipes. The four brothers mentioned above all possessed titles, being respectively Batin, Mentri, Toh Kampong and Penghulu. The following list of tribal officers was given, and they were said to have precedence as enumerated. If this information is correct, and the natives insisted that it was, the order is distinctly unusual; since the Batin, Jinang and Jukrah are the chief officers among most southern tribes.

- (1) Batin.
- (2) Penghulu dalam.
- (3) Toh Kampong.
- (4) Mentri.
- (5) Jukrah.
- (6) Jinang.

According to these Jakuns' own account their place of origin was the Klau River* and there are said to be more of the tribe at Jeram.†

PERSONAL APPEARANCE AND CHARACTER.

Of the four adult males seen, three were distinctly handsome and well built, especially the youngest of them, Bongsu. The fourth man, who was suffering from a bad foot, and was covered with *kurap* (*Tinea circinata*), so that he had not a very prepossessing appearance. One of the younger women who had given birth to a male child the night before the writer's first visit, was also good-looking. She seemed to be suffering very little from her recent trials and insisted on coming to the door of the hut to be photographed, although she was told to keep quiet inside. The hair of all the people was either straight or very slightly wavy, while their skin colour was as light as that of the local Malays. Though accused by the Malays of being lazy, a failing from which the latter are not unknown themselves to suffer, they seemed to be a pleasant, well mannered, and contented people.

WEAPONS.

The blow-pipe is of the usual Negri Sembilan type and calls for no special remark. The outer tube is decorated with incised patterns reaching from above the mouth-piece to the

* A tributary of the Semantan River, Pahang.

† On the Bentong River, not far from the Klau.

node, separating the two internodes of bamboo of which the outer case is formed. The quivers seen, with one exception, were without covers of any kind, the Jakuns saying that they were too lazy to make them. In the one complete specimen, the sides of the cover were made of plaited rattan and the top of a piece of wood, flat above, but with a conical projection on the under surface, which fitted into a space in the centre of the quiver, inside the dart holders. The darts were short, as is generally the case in Negri Sembilan. The poison for the dart points was said to be made of *getah ipoh* obtained from the Kayas tree (*Antiaris toxicaria*) and from *akar tengah* (?), a kind of liana.

OBJECTS COLLECTED.

As remarked above the tribes visited proved to have few objects of interest to a collector and the only specimens obtained at Titi Ramei were a single blow-pipe, a quiver without a cover, two snares of fine cord made from the bark of the *Terap* tree (*Artocarpus Kunstleri*), a *chapeng* (little girls' fig leaf) made from a piece of a tortoise shell and a bamboo flute with three stops. The nose flute is not used.

FIRE MAKING.

The only method of making fire which the Pertang people know, other than by cheap matches purchased at the Chinese shops, is by flint and steel. One man said that he had once tried to make fire with a rattan saw and a piece of soft wood, but had been unsuccessful.

RELIGION AND SUPERSTITIONS.

The Pertang aborigines seem to have no belief in any supreme Deity of their own, though they know of the Malays' *Tuhan Allah*. They are, however, much afraid of what they call *Punan*, which seems to be a personification of all the ills which may befall them in the jungle. Before starting on a journey it is necessary to burn incense to *Punan* and the man who cooks for the rest of the party in the jungle must also burn a little incense each time he prepares food; while if a stranger passes when cooking is going on he must take a little rice or water from the pot and call *Punan* to partake of the offering that he is making, at the same time smearing the rice or water on the back of his neck or on his left forearm. If *Punan* is not appeased, some calamity is sure to happen, the person or persons who have failed to make the customary offerings, will suffer from fever, or swellings in the groin, or will be bitten by snakes or centipedes. It is said that *Punan* stabs those who have offended him (and thus causes their illness).

The *semangat padi* or rice soul is said to be taken where hill padi is planted, an old woman going into the crop before reaping commences and cutting seven ears. Three days after

the taking of the *semangat* general reaping may be begun. The *semangat* is hung up in the house in a basket and is finally mixed with the seed padi for the next crop.

It is tabu for the Pertang people to mention the name of either father or mother. On being questioned as to the reason for this they replied "*kita takut mati, kena daulat ayah*,"—we are afraid of dying through being struck by the indwelling power (*daulat*)* of our father.

There is no Pawang or Bomor (magician or doctor) at Titi Ramei and in cases of sickness they call in the Batin of a tribe living at Durian Tawar, who is supposed to be skilled in magic.

CIRCUMCISION AND TOOTH FILING.

Circumcision† is customary for males, though not compulsory, and many of the women undergo a corresponding operation. Bongsu, one of the four brothers mentioned above had not been circumcised, though he was about twenty years of age. He had a long lock of hair like the *jambul* of little Malay boys, which he rolled into a ball on the front of the head, but whether he wore this as a sign that the operation had not been performed, or merely as an ornament, the writer did not find out. Possibly the custom of circumcision has been adopted in imitation of the Malays.

Tooth filing is general.

MARRIAGE.

Apparently the people of Titi Ramei do not marry among themselves, the reason probably being that they are all closely related. They said they took wives either from the Durian Tawar tribe, or from another settlement at Durian Tipus.

LANGUAGE.

The only words, other than Malay, obtained from the Pertang Jakun were as follows:—

Gibbon (ungka)	...	...	Timok.
Kingfisher (pekakak)	...	...	Burong changah.
Millipede (sepak bulan)	...	...	Gelentu.
Blowpipe (sumpitan)	...	...	Temiang.

* *Daulat* is the peculiar sacred power which invests Royalty, and which is also communicated to regalia. Formerly the belief in this divine power of kings or chiefs, which is a very widely spread one, was strong among the Maories of New Zealand, and in most of the Islands of Polynesia, where it was thought that if any commoner were to unwittingly offend against the royal tabu by using an article which belonged to a king or chief he would be stricken ill and die; there are several well authenticated cases of natives of Polynesia, who had' without knowing it, broken a royal tabu, having actually died of fright when informed of their crime. Deaths said to be due to violation of the sanctity of the regalia of Malay Sultans are not unknown in the Peninsula (vide "Malay Magic" p.41).

† The word used for circumcision was *sunat* which is the usual word for the operation among the Malays, but possibly they may really practice incision which is found among many Jakun tribes.

Blowpipe Mouthpiece (pangkal sumpitan)	Tebong temiang.
Dart Quiver (tabong bekas damak)	Telak damak.
Quiver cords (tali tabong) ...	Tali telak.
Butt of dart (pangkal damak) ...	Pahabong damak.
Dart-holder (sarong damák) ...	Plet damak.

THE JAKUNS OF DURIAN TAWAR, NEAR PERTANG. (Pl. xxix).

These people came down to Mr. Hubback's estate on being called by his Malay tracker Yassin. They were led by an old man who turned out to be a most unmitigated rascal, and the whole party, probably at his instigation, were loud in cadging for money. The old man, who was the Batin, appeared to have travelled a great deal and to have lived with the Besisi in Selangor. A short vocabulary was obtained from him, which appeared to resemble greatly a Besisi dialect; but this was left uncompleted, since it was intended to visit his settlement a couple of days later. However, on it being mentioned to the Titi Ramei people that the Durian Tawar aborigines spoke a Sakai (non-Malay) dialect they seemed surprised and said; "Well, we know all about the Durian Tawar people, as we frequently take wives from there, but we have never heard them speak anything but Malay, as we do." On talking the matter over further it became evident that the Durian Tawar Batin had deliberately given us Besisi words, a knowledge of which language he had picked up on his travels, his idea probably being that the white man would be better pleased to hear that his people had a language of their own, than that they merely spoke Malay. The intended journey to Durian Tawar was not carried out in consequence of the unreliability of the Batin.

THE SERTING JAKUN. (Pl. XXX.)

The Serting people did not prove to be much more interesting than the aborigines seen at Pertang or Kelapi, except in so far as they were not a Malay-speaking tribe, but of course they were quite familiar with that language for purposes of conversation with outsiders. The few of them seen, made a very favourable impression on the writer, as did the people of Titi Ramei; their manners were good, and they did not clamour for presents or money as do so many of the tamer aborigines. Only one small settlement was visited, which was close to an estate at Bahau belonging to Mr. M. Hemmant, who very kindly put the writer up for a few nights, and did everything in his power to make the visit a success.

TRIBAL NAME.

The Serting people are called by the Malays either "Orang Bukit," a very general name for a original tribes, or

Sakai Semlai (or Semleh). The latter name refers to their language, which, for some undiscoverable reason, is called Semlai. According to their own account they call themselves *Bekturk Chong*, which has exactly the same meaning as the Malay, *Orang Bukit*, i.e. Hill People.

TRIBAL OFFICERS.

The following are the names of tribal officers given in their correct order of precedence.

1. Batin.
2. Mentri or Jukrah.
3. Jinang.

On the death of the Batin the Jukrah usually replaces him, and the Jinang becomes Jukrah.

HABITATIONS.

The few houses seen were similar to those of the poorer local Malays, except that they lacked a cook house (*dapor*) and were not divided up into rooms. The house walls were made of the bark of the *kepong* tree and the floor was of bamboo laths. Cooking was done on an open hearth of dried mud. One house had the space between the floor and the ground fenced in to form a fold (*kandang*), for a few goats which the owner was rearing.

BLOW-PIPES, QUIVERS AND DART POISON.

The blow-pipe is similar to that of the Pertang people. The only dart-quiver seen was without a cover. Poison for blow-pipe darts was said to be composed of the juice of the *kayas* tree (*Antiaris toxicaria*) mixed with *akar ipoh* (probably some species of *strychnos*).

FIRE-MAKING.

The methods of making fire with a rattan saw and a block of soft wood, or with a drill and block were both known.

AGRICULTURE.

The houses of the Bahau settlement were situated in a fairly large clearing planted with *kaladi*, but *ubi kayu* (tapioca) and hill rice are also grown to a certain extent. According to the Jukrah, a clearing is only used for a year i.e., long enough to get a crop from it, and is then abandoned.

INTOXICANTS.

As among several of the tribes of Selangor and Negri Sembilan, notably the Besis, an intoxicating drink is brewed from the *tampoi* fruit. The liquor is not stored, but consumed as soon as ready for use. The *tampoi* season is the great time

for feasting, and the Seriting people at the time of the writer's visit were feeling rather sorry for themselves because the *tampoi* trees had failed to fruit.

RELIGION AND SUPERSTITIONS.

The Seriting people say that they believe in a Supreme Deity (*Tuhan Allah*) and that after death the good go to *Shurga* (Heaven), while the bad are condemned to suffer in *Neraka* (Hell), but these ideas have obviously been adopted from the surrounding Malays. Much more interesting were the beliefs connected with the *poYang's** methods of treating the sick. The Jakuns said that their *poYangs* often worked their spells for the recovery of the sick in a beehive hut of palm leaves† in the depths of the jungle, the interior of the hut being decorated with the long ceremonial hangings of plaited leaves which are known as *jari lipan* or centipedes toes. On being asked what was the use of the *jari lipan*, one old man replied that in his conjurations the *poYang* made use of a good spirit called the *Mambang* (not the same as the *Mambang* of the Malays, the personification of the sunset glow). "The *Mambang* lives on the hills and the shadows of the *jari lipan* within the *poYang's* hut stretch out to the hill tops and form a path for the *Mambang* to descend to the hut at the *poYang's* request. When the *Mambang* has come down into the hut the *poYang* tells him to go and look for the soul of the sick man. The *Mambang*, obeying the *poYang's* command, goes back to the hills by the road that he came, and when he reaches them journeys to the houses of the evil spirits who live on the hill-tops. Outside their houses are the souls (*semangat*) of many people hanging up in cages, and if he finds the soul for which he is looking the sick man recovers, but if the evil spirit has carried the soul into his house he is unable to release it and the sufferer dies."

According to the same old man, people fall ill because evil spirits lie in wait for them and strike their shadows with a club as they pass.

As among the Pertang Jakuns *Punan* is feared and propitiated. Water in which rice is cooking is taken from the pot and rubbed on the fore-arm, the man who is making this offering calling out "*Punan, Punan, Punan,*" and at the same time stretching out the arm on which he has smeared the rice water.

The *semangat padi* is said to be taken occasionally when they have a rice crop.

The names of father or mother, father-in-law or mother-in-law must not be mentioned.

* The *poYang* among these southern tribes has the position of both the Malay *pawang*, magician, and the *bomor*, doctor.

† This procedure is similar to that of the Ulu Langat and Ulu Kenaboi *poYangs*.

BURIALS.

Graves are stated to be railed in with a trellis work fence (*pagar tingalong*). Deaths are an occasion for feasting, but it is said that no offering of food is placed on the grave.

MARRIAGE.

Marriages, which are celebrated with feasting, usually take place between members of the same tribe, but occasionally they are contracted with strangers. Second cousins (*dua pupu*) are prohibited from marrying, but marriages between third cousins (*tiga pupu*) are allowed.

CIRCUMCISION AND TOOTH FILING.

Both circumcision and tooth filing are general among the men.

VOCABULARY.

English—Malay.		Serting River Jakun (Bekturk Chong.)
Head—kepala	...	koie.
Ear—telinga	...	tung.
Eye—mata	...	mot.
Nose—hidong	...	muh.
Nostril—lubang hidong	...	liang muh.
Cheek—pipi	...	meng.
Mouth—mulut	...	M.*
Lip—bibir	...	M.
Tongue—lidah	...	lepes.
Tooth—gigi	...	lemoin.
Chin—dagu	...	M.
Throat—leher	...	lengek.
Neck—tengkok	...	baseng.
Shoulder—bahu	...	bahuk.
Arm—lengan	...	bleng.
Elbow—siku	...	chinchung.
Hand—tangan	...	ti.
Thumb—ibu tangan	...	gadut ti.
Finger—jari	...	jarek.
Finger-nail—kuku	...	cherus.
Thigh—paha	...	belu.
Knee—lutut	...	kaltong.
Shin—tulang kring	...	betis.
Foot—kaki	...	jong.
Heel—tumit	...	M.
Sole—tapak kaki	...	tampar jong.
Toe—jari kaki	...	jarek jong.
Breast—dada	...	M.
Back—belakang	...	cherolu.
Heart—jantung hati	...	jantung.

* The letter M indicates that the word used is the same as the Malay.

English—Malay.		Serting River Jakun (Bekturk Chong).
Liver—hati	...	... gris.
Stomach—perut	...	... lepoit
Navel—pusat	...	... M.
Intestines—isi perut	...	... kung weit.
Blood—darah	...	... maham.
Bone—tulang	...	... je-arng.
Skin—kulit	...	... M.
Hair—rambut	...	... suk.
Old—tua	...	... gedoh.
Young—muda	...	... mudak.
Fat—gemok	...	... M.
Thin—kurus	...	... M.
Hot—panas	...	... pret.
Cold—sejok	...	... tekot.
Blind—buta	...	... butak.
Deaf—tuli	...	... M.
Dumb—bisu	...	... M.
Fever—demam	...	... trok.
Itch—kurap, kudis	...	... M.
Vomit—muntah	...	... kaku.
Gripes—sakit perut	...	... ni lepoit.
Diarrhoea—cheret	...	... jer-jaur.
Cough—batok	...	... M.
Dead—mati	...	... kebus.
Putrid—busok	...	... see-it.
Father—bapa	...	... apet.
Mother—ibu	...	... M.
Husband—laki, suami	...	... kenlug.
Wife—bini	...	... kempun.
Male—jantan	...	... remol.
Female—betina	...	... kedol.
Man—orang laki-laki	...	... kenlug.
Woman—orang perempuan	...	... kedol.
Person—orang	...	... berkturk.
Son—anak laki-laki	...	... kenon remol.
Daughter—anak perempuan	...	... kenon kedol.
Child—kanak-kanak	...	... kenkon raket.
Boy—budak laki-laki	...	... kenon remol.
Girl—budak perempuan	...	... kenon kedol.
Maiden—anak dara	...	... kedol darah.
Elder brother—abang	...	... i-ek.
Elder sister—kakak	...	... gah-u.
Younger brother—adek	...	... M.
Younger sister—adek perempuan	...	... adek kedol.
Elephant—gajah	...	... M.
Rhinoceros—badak	...	... M.
Tapir—tenok, badak tampong	...	... M.
Gaur—seladang	...	... M.
Bear—beruang	...	... M.
Deer—rusa	...	... jisuk.

English—Malay.	Serting River Jakun (Bekturk Chong).
Chevrotin—napoh, pelandok	... chee-ong, plandok.
Wild-pig—babi hutan	... jalu.
Porcupine—landak	... jēkos.
Dog—anjing	... chor.
Wild dog—anjing serigalla	... chor bri.
Tiger—harimau	... pōdong.
Black panther—harimau kumbang	... pōdong.
Wild cat—kuching hutan	... kuching bri.
Cat—kuching	... M.
Bear-cat—benturong	... ?
Civet-cat—musang	... M.
Large squirrel—tupai nandong	... M.
Small squirrel—tupai kampong	... M.
Flying lemur—kubong	... M.
Loris—kongkang, kera duku	... riu.
Bamboo-rat—dekan	... M.
Rat—tikus	... kanek.
Gibbon—ungka	... tau.
Monkey—lotong	... baseng.
„ kera	... trau.
„ berok	... kok.
Fruit-bat—keluang	... M.
Bat—kelawar	... semah, sentot.
Crocodile—buaya	... kerbok.
Monitor-lizard—biawak	... pari.
Grass-lizard—bengkarong	... M.
Flying-lizard—chichak kubin	... M.
Land-tortoise—kura-kura, baning	... yeoh, (M).
Water-tortoise—labi-labi	... M.
Snake—ular	... tejoh.
Python—ular sawah	... tejoh (no other name).
Frog—katak	... M.
Fish—ikan	... chereh.
Horn—tandok	... M.
Tusk of elephant—gading	... M.
Tail—ekur	... pas.
Hornbill—enggang	... tekūup.
Hawk, eagle—lang	... kalang.
Owl—burong hantu	... chīim.
Egret—bangau	... banghau.
Jungle-fowl—ayam denak	... hayam.
Argus-pheasant—kuau, kuang	... kaung.
Green pigeon—punai	... M.
Crow—gagak	... agak.
Kingfisher—pekakak, raja udang	... M.
Woodpecker—pelatok	... M.
Magpie-robin—murai	... chītoi.
Egg—telur	... kapoh.
Feather—bulu ayam	... suk hayam.
Beak—paroh	... chēnu.

English—Malay.	Serting River Jukun (Bekturk Chong).
Ant—semut ...	M.
Red ant—kerengga ...	M.
White ant—anai-anai ...	run.
Bee—lebah ...	ibu.
Honey—ayer madu ...	? (manisan).
Wax—lilin ...	M.
Hornet—tebuan ...	hong.
Wasp—penyengat ...	kemut ket.
Fly—lalat ...	roie.
Black scorpion—kala ...	keleutam.
Small scorpion—kala jengking ...	pepesan.
Centipede—lipan ...	kai-ip.
Millipede—sepak bulan ...	kelui.
Cockroach—lipas ...	sebertek.
Spider—laba laba ...	kelekap.
Coconut-beetle—kumbang ...	M.
Mosquito—nyamok ...	semoin.
Tree—pokok kayu ...	delong.
Bough—dahan ...	roh.
Root—akar pokok ...	rēs.
Leaf—daun kayu ...	daun delong.
Flower—bunga ...	bekau.
Fruit—buah kayu ...	plē.
Fungus—chendawan ...	M.
Bamboo—buloh, aur ...	ding.
Rattan—akar ...	dreh.
Thorn—duri ...	jarlah.
Rice—padi ...	babah.
„ beras ...	beras.
„ nasi ...	hūit.
Banana—pisang ...	tiuk.
Areca-nut—pinang ...	M.
Durian—durian ...	M.
Tampoi—tempui ...	M.
Rambutan—rambutan ...	M.
Sireh-leaf—daun sireh ...	M.
Screw-palm—pandan, mengkuang ...	M.
Terap-tree—pohon kayu terap ...	delong meran.
Forest—hutan ...	bri.
Yam—ubi kayu ...	hubi.
„ keledak ...	M.
„ keladi ...	rebol.
To walk—berjalan ...	suak.
„ run—lari ...	paloh.
„ stand—berdiri ...	uh-ow.
„ sit—dudok ...	kem-kom.
„ lie down—berbaring ...	dem-dum.
„ sleep—tidur ...	jepek.
„ snore—berdengkur ...	bersenur.
„ jump—melompat ...	M.

English—Malay.	Serting River Jukun (Bekturk Chong).
To climb—memanjat ...	... yaur.
„ hold—pegang ...	... tenglong.
„ lift up—angkat ...	... M.
„ throw—lempar, lontar ...	... jah jok.
„ scratch—garu ...	... gah-gish.
„ spit—ludah ...	... tātōh.
„ bite—gigit ...	... gingoin.
„ pinch—chubit ...	... chet kīt.
„ wash—membasoh ...	... M.
„ bathe—mandi ...	... hūm.
„ cook—memasak ...	... panchin.
„ eat—makan ...	... chiar.
„ drink—minum ...	... jāh-oh.
„ chew—mamah ...	... M.
„ fly—terbang ...	... pēr̄h.
Sun—matahari ...	... M.
Moon—bulan ...	... M.
Star—bintang ...	... M.
Cloud—awan ...	... M.
Mountain—gunong ...	... chong.
Hill—bukit ...	... chong.
Day—siang hari ...	... siang tingi.
Night—malam ...	... petom.
Thunder—guroh, petir ...	... M.
Wind—angin ...	... M.
Rain—hujan ...	... lesum.
Storm—ribut ...	... M.
Fire—api ...	... ūs.
Water—ayer ...	... jah-oh.
Smoke—asap api ...	... jek-turkūs.
One—satu ...	... moie.
Two—dua ...	... duah.
Three—tiga ...	... 'mpe.
Four—empat ...	... 'mpun (five=mesong) six=peruk.
Ashes—abu ...	... habuk.
Salt—garam ...	... M.
Tobacco—tembakau ...	... M.
Stone—batu ...	... M.
Earth—tanah ...	... ateh.
A clearing—ladang ...	... dehūh.
House—rumah, pondok ...	... dol, pondong.
Roof—atap rumah ...	... hatap.
Chopper—parang ...	... waie.
Axe—kapak, beliong ...	... M.
Knife—pisau ...	... waie gos.
Cloth—kain ...	... M.
Girdle—gendit, kendit ...	... M.
Spear—lembing ...	... lembeng.
Blowpipe—sumpitan ...	... ding.

English—Malay.	Serting River Jakun (Bekturk Chong).
Mouthpiece—pangkal sumpitan	... delong ding.
Muzzle—mata sumpitan	... soin ding.
Quiver—tabong bekas damak	... lūk.
Quiver-cords—tali tabong	... tali lūk.
Dart—damak	... damak.
Point of dart—mata damak	... cheh (poison) damak.
Butt of dart—pangkal damak	... pahabong damak.
Dart-holder—sarong damak	... blēt.
Poison—ipoh	... cheh.

THE JAKUN OF INAS. (Pl. xxx).

A short visit was paid to an aboriginal settlement named Kelapi which was situated rather more than a couple of miles from Kampong Inas, near Johol. The distance from Inas to the Jakun village was traversed on foot, the baggage being carried by a mixed crew of Malays and Jakuns along a rough mining road. When nearing Kelapi, a small party of Jakuns were encountered sitting under a tree by the wayside. These people volunteered the information that they were Catholics, and had come originally from the mission at Ayer Salak, about nine miles from Malacca. They had with them a little boy of about two years old who had a very light skin and looked distinctly Chinese. On being asked if the child was one of theirs, the oldest man of the party said that it was his grandson, his daughter having married a Chinese mechanic at Malacca. A few of these mission Jakuns were scattered about in several of the neighbouring aboriginal settlements, notable Charek and Miku. The name of Father Borie, the Founder of the Ayer Salak mission is still known among them, and Emi, the old man mentioned above said that he could remember him, though he was only a youngster when Father Borie left Malacca owing to ill health.* There were no Catholics in the settlement of Kelapi. All the Jakuns met near Inas were pleasant and well mannered people, though to an ethnographist they were not particularly interesting, since they had to a very large extent adopted Malay fashions.

HABITATIONS.

The houses of the Kelapi aborigines were similar to those of the Pertang and Serting Jakuns. The space between the flooring and the ground was fenced in to form a fold (kandang) for sheltering goats and fowls at night, and one of these folds contained a tame deer.

AGRICULTURE.

The kampong had quite extensive wet rice (*sawah*) fields, which were well protected by fences. Buffaloes, of which the

* He was said to have died on the voyage to Europe.

Jakuns had several had been turned loose among the stubble of last year's crop. A remark made with regard to these animals rather well illustrates the Jakuns' attachment to their old wandering habits. On one man being congratulated on the prosperous appearance of the village, and possession of goats, buffaloes and fowls, he replied, "Oh yes, it is very nice, but one day we shall get tired of it all, sell the whole lot, and move off somewhere else."

THE BLOW-PIPE.

The description already given of the blow-pipes of the Pertang and Serting peoples applies equally well to those of the Inas Jakun. The only quiver seen had a conical wooden top to the cover, the sides being made of plaited rattan.

Blow-pipes are still used a good deal, though the Jakuns have some fearful and wonderful old muzzle loading guns of which they are extremely proud.

RELIGION AND SUPERSTITIONS.

The beliefs of the Pertang and Bahau people with regard to *Punan*, and the *Poyang's* use of the *Mambang* were confirmed by the people of Kelapi. In addition, a field tabu similar to one in force among the Besis of Selangor was obtained from them. It was said that in preparing ground for cultivation great care must be taken not to disturb the *Hantu Tanah* (earth spirit) or *Jembalang*. When once a clearing has been made, no tree stump or old branch must be struck with a parang, or the *Hantu Tanah* will be aroused and will appear in the form of rats or mice and destroy the crop.

The *semangat padi* (rice soul,) which by these people is called the *kepala padi* is said to be taken for both dry and hill rice.

The names of mother-in-law, father-in-law, mother or father should not be mentioned. A man is said to be *tenung* (afraid) to mention these forbidden names, or those of any of the fiercer kinds of animals found in the jungle.

XII. SOME SEMANG VOCABULARIES OBTAINED IN PAHANG AND PERAK.

Vocabulary I.—Pangan of Cheka, Central Pahang.

This vocabulary was taken by I. H. N. Evans, the tribe speaking it being described in No. 4, Vol. V. of this Journal.

Vocabulary II.—Semang of Ijok, Selama. North Perak.

Taken by H. C. Robinson and C. B. Kloss in April 1909: *vide* No. 4, Vol. V.

Vocabulary III.—Orang Bukit of Lenggong, Upper Perak.

Taken by H. C. Robinson and C. B. Kloss at Ijok, Selama, in 1909. The people are described by I. H. N. Evans, in No. 2, Vol. V.

Vocabulary IV.—Sakai Jehehr of Temengoh, Upper Perak.

The Sakai Jehehr appeared to us nearly pure Negritos and are fairly numerous in the neighbourhood of Temengoh, living in a state of absolute dependance, hardly to be distinguished from slavery, on the local Malays. We could see no characters which would differentiate them physically from the Semang of Ijok except that on the whole they are perhaps a somewhat taller and more robust race, perhaps less affected by *kurap*.

The vocabulary was taken at Temengoh on July 9th, 1909 and checked from a second member of the tribe a few days later. The Ethnology and physical anthropology of the tribe have been dealt with by Dr. Annandale and one of us and photographs of the people reproduced [Fascic. Malay. Anthropology, Part 1. pp. 27, 28, 112, 159-162 (1903)].

Vocabulary V.—Sakai Tanjong or Sakai Jehehr Blukar of Temengoh.

This vocabulary was taken by H. C. Robinson and C. B. Kloss at Temengoh in July 1909 from a small tribe of six men, who visited that village. In complexion and skin they were very dark, almost chocolate, with very broad nose, prognathism was slight and the oldest man had a very wedge shaped face, was relatively very tall and had grizzled hair. One youth was very much yellower than the others, with more oval eyes, possibly indicating an admixture of Chinese blood. His colour was practically identical with that of the local Malay.

Vocabulary VI.—Sakai Tanjong or Semang Paya.

Elicited from a party of half a dozen men met at Grik Rest house by H. C. Robinson and C. B. Kloss. They appeared to be physically true Negritos and ranged from Betong in Rhaman to Lenggong west of the Perak River.

VOCABULARY.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukat, Temengoh, Upper Perak.	Sakai Tanjong or Semang Paya, Kampung Padang, near Grik, Perak.
Head—kepala	kuie	kui	kūu	koi	koi	koi.
Ear—telinga	untugn	enteng	kentakn	enteng	enteng	enteng.
Eye—mata	met	met	man	met	met	man.
Nose—hidong	moh	mah	muh	moh	moh	muh
Nostril—lubang hidong	avang moh	leng mah	sema muh	..	umpong	senyoh muh.
Cheek—pipi	ming	kebal	kapar	kapa	kapor	pempak.
Mouth—mulut	hain	haing	nyiang	tenut, heng	heng	nyag.
Lip—bibir	tenud	chong	tening	tenut	tenut	tenid.
Tongue—lidah	letig	litik	lentakn	lintek	lintek	untagn.
Tooth—gigi [seems to be no real word for tooth (tulang hain = "mouth bones"), among Pangan.]	tulang hain	yus	lemoign	hain, heng	heng	lemoin.
Chin—dagu	yangkwet	engkeh	jak-ah	yungka	jangka	jakā.
Neck—leher	chenorong	chenot	sagon(g)	ungut	ungut	sagob.
Throat—tengkok	tengkok	tabok	tengkop	plengka, prengong	..	klapoh.
Shoulder—bahu	klapoig	klaph	klapoh	klapa	klapa	bi.
Arm—lengan	beling	ching	blung	chendren, chi-ah	chindren	siku.
Elbow—siku	kénung	kai yong	kanyong	kayan, kaltong	kayon	tehn.
Hand—tangan	chias	chas	tung	chias	chias	tabok.
Thumb—ibu tangan (said to be no separate name for thumb as distin- guished from fingers among Pangan).	boh chias	ibu cahs	taboh	tabok	tabok	..
Finger—jari	boh chias	wing chas	..	chindras	chenros	tengoin.
Finger-nail—kuku	kelekok	telokok chas	chin-yos	..	..	chinyos.

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjung or Semang Paya, Kampong Padang, near Grik, Perak.
Thigh—paha	bleh	blöh	bleh	belut	belut	tahn.
Knee—lutut	kaltong	kartong	kaiyol	kaltong	kaltong	kaiyol.
Shin—tulang kering	langod	goh	kete	keting, gor	gor	ketek.
Foot—kaki	chan	chan	juk	chan	chan	joh.
Heel—tumit	dedul	deldol	deldol	deldol	deldol	tampai.
Sole—tapak kaki	tapak chan (k sound).	..	kedal	dada chan	dada chan	..
Toe—jari kaki	boh chan	wing chan	tabok	chan	tabok	tabok juk.
Breast—dada	chënar	söp	mem	dada	dada	dada.
Back—belakang	kerok	kiar	kivok	kroh	kroh	piyök.
Heart—jantung hati	mangkol	langis	söb	klangis	k'langis	hüp.
Liver—hati	kelangis	yos	hüb	klap	rüs	vis.
Stomach—perut	kud	chong	kud	et	et	kud.
Navel—pusat	see-eg	lus	panik	düt	düt	et
Intestines—isi perut	ichugn	et chong	eg chong	et chüng	bab	panih.
Blood—darah	maham	et chong	darah	darah	behum	id kud
Bone—tulang	jee-ing	tuleng	ja-ang	jehing	jing	daiyah.
Skin—kulit	ketok	ketok	ka-teng	ketut	ketut	jaak.
Hair—rambut	sog	sok	sintal köi	sokui	sok koi, sed	kalegn.
Old—tua	talü	bidok	bidog	kebit	kebit	sintok kui.
Young—muda	awong-dah	anek	balen (female)	kejuk	kejuk	litog.
Fat—gemok	bechok	munchal	chikek	krajuk	boh	kaiynd.
Thin—kurus	jerengkong	tapong	kebed	seg (?)	charib	kivus.
Hot—panas	büd	ka-oit	boi	hod	bekud	bud modis.
Cold—sejuk	tongked	hinyeh	sejuk	bekut	sejuk	lekad.
Blind—buta	chok-med	hol	pan	kerkoh sijai	chung	pad man.
	..	..	..	chok	..	..

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong, or Semang Paya, Kampong Paya, near Grik, Perak.
Deaf—tuli	dul	dol	dol	..	..	dul kentuk.
Dumb—bisu	kébok	lawa	budak	..	..	bodoh.
Fever—demam	payah	konkong	mai	tenkat, nemsong	tongket	inyit.
Itch—kurap, kudis	kurap, chüd	gash	betush	chut, korap	chud	klab.
Vomit—muntah	koh	koh	koh	kar	koh	kohb.
Gripes—sakit perut	betis küd	pia chong	inyi kud	petiss, kapet	petish	inyit kud.
Diarrhoea—cheret	che-ed	mahum (?) dysen- tery).	..	et cheret nak eg	cheret	chi id.
Cough—batok	nah-oh	chituk	se ön	chetok (?)	chetok	ken hul.
Dead—mati	këbus	kebus	kebus	kebis	kebis	kebus.
Putrid—busok	hah-ad	kuhut	he hun	ha hat	ha et	liu.
Father—bapa	aign	eh	doh	ai, eh	eh	dög.
Mother—ibu	boh	na	nya	buh, bur	boh	nyau.
Husband—laki suami	ti	kesoi	teh	temkal, kesui	kesui	kiyal.
Wife—bini	gi	kench	baloh	babu, kené	keneh	kedol.
Male—jantan	tungkal	tengkal	enkoing	temkal	tongkal	unkohn.
Female—betina	kong	mabeh	..	babah	baboh	baloh.
Man—orang laki-laki. (Appear to be no separate words for "male" and "mau" among Pangan or if there are could not get them.)	tungkal (?)	..	..	..	..	..
Woman—orang perempuan. (Same thing seems to apply to "female" and "woman" among Pangan)	kong	..	..	..	..	..
Person—orang	batek	..	gob	..	..	gob (Malay) pultau.

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong, or Semang Paya, Kampong Padang, near Grik, Perak.
Son—anak laki-laki. Also to "son" and "boy," "daughter" and "girl."	wong tungkal	wing tengkal	kĕon	wang	ken	kuhn.
Daughter—anak perempuan	wong kong	anek	mĕh	wang ken	mĕh	..
Child—kanak-kanak	wong kanid	..	panoh	..	..	..
Boy—budak laki-laki	? wong tungkal	..	..	..	..	..
Girl—budak perempuan	? wong kong	..	..	..	..	..
Maiden—anak dara	wong keradah	..	k(e)toh	baloh	anek	baleh.
Elder brother—abang	tok tungkal	..	..	pe(n)	pehr	klöh.
Elder sister—kakak	tok kong	..	..	behr	..	..
Younger brother—adek	bel tungkal	behr	poh	behr (?)	behr	pöh.
Younger sister—adek perempuan	bel kong	behr mabeh	..	..	..	poh baloh.
Elephant—gajah	leman	gajah	..	gajah, äton	gajah	gajah.
Rhinoceros—badak	hagap	argap	hagab	badak, bada	badak	badag.
Tapir—tenok, badak tampong	bai-id	bai-et	baian	barong, baret	baret	baiyad.
Gaur—seladang	sĕladang	sapi	sapi	..	sapi	sapi.
Bear—bertuang	tĕlĕbas	kau yap	kaweb	kawep	kawep	klabaus.
Deer—rusa	käsar	..	yusa	rusa, kasar	kasa	rusa.
Chevrotin—napoh, pelandok	pachig	pechep	pacheng	bĕhol	plandok	..
Wild-pig—babi hutan	badin	kecheh, napoh	napag	bis	kawen	napag.
Porcupine—landak	balore	laneh	lantoss	lantak(k), laneh,	laneh	lanag.
Dog—anjing	werh	eh	choh	achi	ásoh	chöh.
Wild-dog—anjing serigala	serangul	cheling	chelong	chelong, asu	chelong	choh chelog.
Tiger—harimau	talok	tai yoh	kemeugn	jiok	ab	baling.
Black panther—harimau kumbang..	talok robong	go-ong	chig-chog	..	chi-chok	baling berting.
Wild cat—kuching hutan	? kuching	..	kimkung ai	museng, rubor	élong	kuchig.
Cat—kuching	..	chepu (r)	..	kuching	..	..

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong or Semang Paya, Kampung Padang, near Grik, Perak.
Bear-cat—benturong	..	menjong	mantoi	..	lungan	..
Civet cat—musang	..	mal	manjong (n)	chik-choi	kenseng	musang.
Large squirrel—tupai	linguss	krelat, kedek	seko	kedeg.
kerewak.	..	wai	..	cheri, seko	kedik rampoh	lingus.
Small squirrel—tupai kampong	..	pama	kedeg	kai-e	kai-i	pama.
Flying lemur—kubong	pama	..	chang oit	..
Loris—kongkang, kera duku	kai-yun	kai yum	li-ung.
Bamboe-rat—dekan	..	om	nehoi	kedek	kedik	kedeg.
Rat—tikus	unging	têku	tawa.
Gibbon—ungka	..	tawa	tawah	rampoh	daong	biu.
Monkey—lotong	..	masing	bassoh	daong	bau-ait	..
"—kera	..	jaiyoh	apong	bau-at	kawet	..
"—berok	..	dawai	kawed	..	resel	yai-ah, apong.
Fruit-bat—keluang	..	kauyet	..	rasel	buaya	..
Bat—kelawar	..	buayak	buya	buya	bagen	luya.
Crocodile—buaya	..	bab	bieng	bagen	..	pai-yi.
Monitor-lizard—biawak	..	chichoi	manyong	mandrong	..	kai yoh.
Grass-lizard—bengkarong
Flying-lizard—chichak kubin
Land-tortoise—kura-kura baning
Water-tortoise—labi-labi
Snake—ular	..	awat	kai yoi	sil	auweh, sil	sul.
Python—ular sawah	..	pelet	ple eb	labi	..	labi.
Frog—katak	..	ikop	lajok	tajuk	tajuk	tayok.
Fish—ikan	..	têlen	telat	..	talong	telak.
Horn—tandok	..	kom	kom	changkai, rengkong	chankêh	kom.
..	..	söp	ka	..	gading	ka.
..	tandok.

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong or Semang Paya, Kampong Padang, near Grik, Perak.
Tusk of elephant—gading	gading	..	..	..	..	gadi.
Tail—ekur	hātih	..	sintak	hati	..	sintak.
Hornbill—enggang	tutung	..	yagang	enggang	..	yag-ang.
Hawk, eagle—lang
Owl—burong hantu
Egret—bangau
Jungle-fowl—ayan denak
Argus-pheasant—kuau, kuang
Green pigeon—punai
Crow—gagak
Kingfisher—pekakak raja udang
Woodpecker—pelatok
Magpie—robin—murai
Egg—telur
Feather—bulu ayam
Beak—paroh
Ant—semut
Red ant—kerengga
White ant—anai-anai
Bee—lebah
Honey—ayer madu
Wax—lilin
Hornet—tebuan
Wasp—penyengat
Fly—lalat

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong, or Semang Paya, Kampong Paya, near Grik, Perak.
Black scorpion—kala	juang	mangka	juangai	juang	..	keheb.
Small scorpion—kala jengking	serdol	sedol	selang doi	ke-ep	..	tenteng. ..
Centipede—lipan	nyeyb	ke-ep	keh-ep	kemberbal	..	..
Millipede—sepak bulan	nying	kemaail leg	helap	..	..	..
Cockroach—lipas	lipas	hepip	kimpol	..	..	..
Spider—laba laba	tavoh	tingtong	ting tong	..	..	beng-bing.
Coconut-beetle—kumbang	kumbang	..	laluk	..	..	..
Mosquito—nyamok	kemud	sebung	sebit	..	..	sebi, kaboh.
Tree—pokok kayu	bohoh jehok	eh, heu	kenya-kenya, ncheu	agag	katul	nihong.
Bough—dahan	yoh	chabang	tema	ynerhū	yehong	tema.
Boot—akar pokok	jeh-es	1, es	yees	aweh	yeu	yau, kunen.
Leaf—daun kayu	daun jehok	heli	sela	hali	halib	selā.
Flower—bunga	bekau	bunga	bekan	bungeh	bungeh	bēkau.
Fruit—buah kayu	keboh jehok	kebu (k) eh, hen	kema	kemoh	buah	kēmau.
Fungus—chendawan	kulad (Malay)	kulai	tish	kemain	kaban	tenteng.
Bamboo—buloh, aur	genūn	leber	awen	genung	genun	awen.
Rattan—rotan	awi	aweh	yau	aweh	aweh	yau.
Thorn—duri	jeli	ili	jela	jelah	jerit	jela.
Rice—padi	padi	padek	ba	padeh	padeh	ba.
.. beras	beras	bias	beun	..	..	bias.
.. nasi	mam	..	..	..	..	nasī.
Banana—pisang	kakayu	piseng	teloi	ajoi	ajoi	telu
Arca-nut—pinang	pinang	..	..	..	blung	..
Durian—durian	tueng	pinik	penyug	duren	duren	penyug.
Tampoi—tempni	tampoie	taben	..	garah	..	tempui.
Rambutan—rambutan	tangoie	tangoi	tangoi	tangoi	tangoi kaban	tangoi.

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong or Semang Paya, Kampong Padang, near Grik, Perak.
Sireh-leaf—daun sireh	daun sireh	sieh	sireh	beya	hakek	..
Screw-palm—mengkuang	hakek	bungkuang	..	akeh	..	seket.
Terap-tree—terap	ha-op	ka euk	sa, õg	saok	penjok	weh dog.
Forest—hutan	hob	piang	dabû	behur	hubi (pohr)	yiba.
Yam—ubi kayu	kiyeh	ka euk	hubi	hubi	keh	hubi.
" keledak	simlak	sila	gak	..	gang	kemhâk.
" keladi	talus	..	biag	sur	chub	gah.
To walk—berjalan	chub	chûk	chib	chup	loi	chig.
run—lari	gess	chuk, kieng	tampeng	..	hinjan	chig kenyon.
stand—berdiri	njan	hing, yang	tud	injan	jelieu	tud.
sit—duduk	nog (?)	noik	koit	ingoh	teh	kõt.
lie down—berbaring	teg	chi, pang	bidung	..	..	kli ih.
sleep—tidur	teg	tek	pibus	tek	dujuk	tig.
snore—berdengkur	nerkoie	nerkoï	kekong	knokong	lompet	go-gong.
jump—melompat	melomped	biloi	ud	bueh.	memain	lintek.
climb—memanjat	lu-ig	luek	chab	..	pegen	üg.
hold—pegang	pegeng	chep	angked	..	angket	chab.
lift up—angkat	angked	tijat	bedal	..	..	debli.
throw—lempar, lontar	harad	(en) teng	gi	luyu	..	binti.
scratch—garu	kād	kijik	kebag	akat	gat	gi-ih.
spit—ludah	teurf	beg(k)	kab	beheng	kebet	kebeng.
bite—gigit	kab	ka(a)p	chikan	kang	gih	ing-geh.
pinch—chubit	chuit	chuyip	..	chaking	chakoh	chi-ken.
wash—membasoh	sūd	soit	..	soit	lai	söd.
bathe—mandi	nlare	ilai	mamoh	enlai	..	mamuk.
cook—memasak	chētōh	chita	pegoh	chita	söet	söd bias.

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong or Semang Paya, Kampong Padang near Grik, Perak.
To eat—makan	chi	chi	gū	geh	geh	gi.
" drink—minum	ūm	bu	ong	am	em	ong.
" chew—mamah	tereng	nyiam	kab		reng	ilud.
" fly—terbang	kēpoie	kapoi	heng	kapoi	chu	poi.
Sun—matahari	kanugn	met ketoi	mat yis	ketok	ketok	..
Moon—bulan	rioh	kecheh	bulan	beloi	..	..
Star—bintang	bintang	bintang	bintak	..	binteng	..
Cloud—awan	med ketog	āāl	sagup	sagup	batuk	..
Mountain—gunong	genargun	chebal	paah	poh	sagup	..
Hill—bukit	chebak	chebal	tul	bawoh	jelmol pohr	..
Day—siang hari	keruar	met ketoi chi-eh	yis	henlop	upeng	..
Night—malam	nakud	ek-ut	ngong	kerkut	kerkut	..
Thunder—guroh, petir	ketog kalted	kai	kari	..	..	..
Wind—angin	(?) angin	bewah	choh	bruah	bruah	..
Rain—hujan	haig haid	....	mih	ersim	lising	..
Storm—ribut, angin dras	ohmadiseh	ibut	siak	..	tupan	..
Fire—api	ōs	os	osh	oss	oss.	..
Water—ayer	tom	betieu	tom	..	tom	..
Smoke—asap api	yeh os	i-eh os	ong	eh oss	i-eh	..
One—satu	sa, or nai	ni	ni	nai yebla	paion	..
Two—dua	dua	bieh	nai	duak	duah	..
Three—tiga	tiga	..	tiga	figa	..	..
Four—empat	empat	..	..	ampat	..	..
Ashes—abu	tepūb	tēpīp	abu	..	habok	..
Salt—garam	tepūb	siah	empoig	gaip	empoit	..
Tobacco—tembakau	tembakau	..	bakau	..	jenkut	..

VOCABULARY—Continued.

English—Malay.	Pangan of the Cheka River, Pahang.	Semang Paya of Ijok, Selama, Perak.	Sakai Bukit of Lenggong, Upper Perak.	Sakai Jehehr, Temengoh, Upper Perak.	Sakai Jehehr Blukar, Temengoh, Upper Perak.	Sakai Tanjong or Semang Paya, Kampong Padang, near Grik, Perak.
Stone—batu	batu	batuk	..	batuk	..	..
Earth—tanah	tēh	teh	teh	teh	teh	..
A Clearing—lading	hāli	humah	humah	selai	s'lai	..
House—rumah, pondok	hanyark	hēteh	kudeng	aiya	hang yet	..
Roof—atap rumah	apote	hatep	plong	apoi	kapoi	..
Chopper—parang	wign	hik	ped	besi	besi	..
Axe—kapak, beliong	kapak, beliong	..	beliok	..	..	..
Knife—pisau	landak	batok	lungkoi	taji	kaji	..
Cloth—kain	kain	pinjir	weg	..	penjohr	..
Girdle—gendit, kendit	tentom	..	neig beg gab	penjok	..	..
Spear—lencing	ād	..	bulus	mata	mata	..
Blowpipe—sumpitan	blau	bla'o	..	blao	blas	..
Mouthpiece—pangkal sumpitan	tamam blau	taman	blao yoh	kelutut	tangkal	..
Muzzle—mata sumpitan	kuie blau	..	tamen	tenlai	puchup	..
Quiver—tabong bekas damak	banuk	gōih	nyiang	baneu	banuk	..
Quiver-cords—tali tabong	tali banuk	..	awen	aweh	chenoss	..
Dart—damak	tenlaid	tenlaik	..	tenlaik	tenlaik	..
Point of dart—mata damak	mothr tenlaid	chemat	seloig	ipoh	dog	..
But of dart—pangkal damak	behr tenlaid	libot	telaig	brul	brul	..
Dart-holder—sarong damak	pelig	dok	biai	..	..	..
Poison—ipoh	douk	..	dog	dok	dōg	..

XIII. THE BOTANY OF GUNONG TAHAN, PAHANG.

By H. N. RIDLEY, C.M.G., M.A., F.R.S.

LATE DIRECTOR OF BOTANIC GARDENS,

STRAITS SETTLEMENTS.

As it was intended to collect as thoroughly as possible on the highest mountains of the Tahan Range, the plant-collector who was sent ahead with the baggage to Wray's Camp was instructed not to collect till he reached that point, an altitude of 3,300 feet. Unfortunately he was attacked with Malaria immediately he arrived there, and was sent back after our arrival. I had, however, thanks to the kindness of Mr. Robinson, the use of two Dyaks in collecting, who proved very useful and were excellent plant-collectors. The Europeans of the party, Mr. H. C. Robinson, Mr. C. B. Kloss, and myself, started from Kuala Lipis in a house-boat on June 27th, arrived at Kuala Teku on July 3rd, and reached Wray's Camp July 6th, where regular collecting commenced.

No attempt was made at collecting before this point was reached, as the plain country through which run the Pahang and the Tembeling Rivers had been fairly well investigated in my first trip in this region in 1890, as had also the forest-flora of the Tahan River. The account of the plants collected there was published in the 'Transactions of the Linnean Society, Botany,' series 2, vol. iii. pp. 267-408.

These two distinct floras are very different from any floras of the west coast of the Peninsula, that of the plains containing many more of the typical Siamese plants, as well as an additional number of Australian types, missing on the east coast.

A few notes taken *en route* from Kuala Lipis to Wray's Camp, however, may be added here. At Jeram Ampai, in the Tembeling River, while the boats were being drawn up the rapids, I found a new species of *Hedyotis*, described later, in company with *Phyllanthus chamaepeuce*, Ridl., on the rocks, and observed *Passiflora foetida* abundant on the river-bank at Pasir Stengah Laut. This South-American plant, introduced into cultivation in Singapore many years ago, seems now to have spread very widely over the whole peninsula, no doubt dispersed by birds.

Along the Tahan River the *Nerrum*, *Dipterocarpus oblongifolius*, was in flower as we went up and fruiting on our return,

NOTE.—The Collection on which this paper is based was made by the author in the course of an expedition to Gunong Tahan in July and August 1912 carried out by the F.M.S. Museums. It was intended to form part of a general account of the mountain, the publication of which has been delayed through various causes, though the greater part is in print.

In order to secure earlier publication of the various new species Mr. Ridley's paper is therefore printed here and apologies are due to the author for the delay in the issue, which has been unavoidable. Ed.

both in the greatest abundance. The tree seems to be confined to the river-edge, over which the huge trunks lean at such an angle that it is marvellous how they can retain their position. Extremely abundant along the Tahan River, it disappears in the Tembeling River, only a comparatively few trees being seen there. *Grammatophyllum*, which was abundant in the forks of these trees, was in bud at the end of June and in flower on our return in August. The narrow-leaved shrubby *Eugenia Heyneana* was in fruit on the journey up (the fruits are globular, pithy, white, and sweet, with a rather unpleasant flavour, and are widely used as bait for fish), but we found it fully in bloom on our return. I had not previously met with flowers, and the shrub seems to be confined to the Tahan River in this country. It is omitted from the 'Materials for a Flora of the Malay Peninsula.'

The typical Tahan River flora continues up to Kuala Teku. During a day or two's stay at this Camp I examined it, and noted such characteristic plants as *Didymocarpus filicina*, *D. pyroliflora*, *Ixora stenophylla*, *Curcuma sylvestris*, *Hygrophila saxatilis*; *Tristania Whitiana* was a common tree along the banks and in full flower. *Burmannia tuberosa* occurred in muddy spots near the Camp. Palms were represented by *Oncosperma filamentosa*, *Pinanga disticha*, and *P. subruminata*, one or two *Iguanuras*, and a good many rattans. But the most interesting was a new species of Bertam palm, *Eugeissona*, which occurred on the hill behind the Camp. On the track towards Wray's Camp I was pleased to recover the beautiful *Eugenia cauliflora*, described by me from a single specimen obtained along the Tahan River. It is a rather small and slender tree, with brilliant crimson flowers borne in clusters on the trunk, resembling those of *Eugenia Malaccensis*, to which the tree is evidently nearly allied.

The woods through which the track to Wray's Camp runs possess a flora much like that of the Tahan forest away from the river, the river-bank flora being absent, the most noteworthy plant seen being the Jungle Waterlily, *Barclaya motleyana*, in a dry patch of mud on the comb of the ridge, a most unusual place for this plant. The men brought into Camp twigs and leaves of a *Cinnamomum* with a very pleasant aromatic taste, which they used as a spice. I was unable to obtain flowers or fruit of it, and certainly never saw it before. *Teysmania altifrons*, Miq., commonly known as *Daun Sang* or *Daun Payong*, but here called *K'roh*, occurs up to about 3,300 feet elevation, close up to Wray's Camp. It is invaluable for roofing huts, as it is easy to fix and quite waterproof and durable.

WRAY'S CAMP.

We reached Wray's Camp, 3,300 feet, on the 6th, and remained till the 9th, during which time I collected a large series of plants in the neighbourhood. Messrs. Robinson and

Wray had previously made collections here, an account of which has been published by me in the 'Journal of the Linnean Society, Botany,' xxxviii. p. 303, the plants recorded therein from 3,300 feet being those collected here. The flora here completely changes on reaching the ridge upon which the Camp is built. Up to this point the flora is that of the Teku woods, and we find such lowland plants as *Calophyllum spectabile*, *Eugenia claviflora*, *Hornstedtia scyphus*, *Memecylon garcinoides*, but along the ridge on which the Camp is built is a more montane flora with some distinct plants. Here we found *Argostenma albociliatum*, Ridl., *Sonerila suffruticosa*, *Gaertnera violascens*, n. sp., *G. lanceolata*, n. sp., *Bulbophyllum vivescens*, a variety of *Pterisanthes coriacea*, *Geostachys rupestris*, and *Pentaphragma grande*. Besides these we got a number of the ridge-plants, characteristic of the rocky ridge running to the west. To the north of the Camp lay a deep wooded valley, through the base of which ran the stream which supplied water to the Camp. The most conspicuous plant here was the fine palm *Livistona Tahanensis*, which was very abundant and afforded food to wild elephants. On one of these palms Mr. Robinson espied a beautiful crimson-flowered shrub, which proved to be a new *Pachycentria* and one with the largest flowers known in the genus. Here also grew *Rhododendron longiflorum*. Descending to the stream, I followed it to its junction with another, and followed this to its source, then, cutting our way along the ridge at further side of the valley, joined the track to Gunong Tahan, and returned to Camp by it. The banks of the stream bore many plants peculiar to this district, notably *Xyris grandis*, *Canscora trinervia*, *Tainia vegetissima*, *Nephelaphyllum pulchrum*, and *Cystorchis aphylla*.

SKEAT'S RIDGE.

The track to Gunong Tahan runs along a succession of precipitous sandstone ridges with a distinctly xerophytic flora. This flora stretches along these ridges as far as the Gunong Tahan Padang, and, though part of it disappears, many of the plants still occur at this place. Aroids, scarce after leaving the Kuala Teku, have disappeared, with the exception of *Scindapsus Scortechinii*. Grasses, except for one or two plants of *Isachne javana*, and sedges, except *Gahnia tristis* and *G. javanica*, are wanting. Gesneraceæ are represented by an epiphytic *Æschynanthus* and *Parabœa rubiginosa*. The palms, except *Calamus elegans* in the damper spots, have disappeared, for the *Livistona*, though occurring in the damp woods running up to the sides of the rocky ridge, can hardly be said to enter this flora. The hygrophytic ferns, *Alsophila*, *Lastrea*, *Cyathea*, etc., are gone, and replaced by the xerophytic species of epiphytic *Polypodium*, *Dipteris Horsfieldi*, *Matonia pectinata*, *Oleandra neriiformis*, and *Schizœa Malaccana*. The *Dipteris* and *Matonia* were so abundant that we used them for bedding. The characteristic shrubs are *Boeckia*,

Leptospermum, *Vaccinium longibracteatum*, *Rhododendron malayanum*, *Anneslæa crassipes*, *Rhodammia trinervia*, var. *montana*, *Evodia pachyphylla*, *Gordonia imbricata*, *Symplocos pulcherrima*, *Olea capitellata*; and *Pentaphylax malayana*, its brilliant red shoots making it very conspicuous all over the forest which lay on the slopes of the ridge. *Burmannia disticha*, *Hedyotis patens*, *Spathoglottis aurea*, *Bromheadia rupestris*, with many epiphytic orchids, made up the herbaceous flora.

THE GULLY.

After passing along this ridge for some distance we came to a wide cleft between two lofty precipices, which we call "The Gully," and here is a steep ascent of about 900 feet over broken rocks and mud. The Gully contains many trees of some size and, being very damp, there are many more hygrophytic plants. On the trees near the entrance grows the pretty creeping *Rhododendron elegans*, and among the rocks *Sonerila cæsia* and *S. tenuifolia*, *Phyllagathis hispida*, *Didymocarpus Robinsonii*, *Loxocarpus incana*, *Begonia Herveyana*, *Lastrea calcarata*, and other such plants. At the top, on trees sloping at all angles and draped with olive-coloured moss, grew *Dendrobium cornutum*. The series of plants here is of a Malayan type, and seems to have pushed up from the low-lying woods of the Tahan and Teku valleys.

THE PADANG FLORA.

The Padang is an extensive plateau of open undulating country from 4,600 to 7,186 feet altitude, including herein the higher peaks. The greater part of it consists of sandstone rocks traversed by veins of white milky quartz, and strewn plentifully with quartz-fragments. This region is traversed by small streams which run down from the higher hills to join the Teku. Along the banks of these streams there is a deposit of peaty soil, which is covered with a close dense wood of small trees, the biggest barely 40 feet tall, most of them only an inch or two through, and often only 2 or 3 inches apart, forming a wood very difficult to pass through. Where the ground through which the stream passes is flat, we find a dampish spot with a certain amount of soil, which bears a vegetation of bushes and herbaceous plants mixed.

The entrances of the flora of this area lie between the dry rock-flora of the open Padang and the wet woodland flora of the upper part of the streams. Some plants are common to both, but then are usually, as might be expected, modified to a certain extent, those on the rocks being more adapted for a xerophytic life than those in the woods.

I will treat of these two floras separately:—

THE ROCK-FLORA.—This flora extends with very little variation over the whole of the stone field to the top of the high ridges of Gunong Ulu Riang, 6,600 feet altitude, and the summit of Gunong Tahan at 7,186. The whole of this area

is covered with low shrubs about 2 feet tall, mixed with herbaceous plants. Here and there we find shrubs attaining a height of some 10 or 12 feet, and these occur mostly on elevated hillocks or ridges. The most abundant plant is *Leptospermum amboinense*, and mixed with it is *Boeckia frutescens*. This shrub often takes the form of a prostrate or almost creeping plant in these spots. With these are the dwarf *Tristania*, *Terminthodia*, *Carallia montana*, and *Calophyllum venustum*. Among herbaceous plants *Xyris Ridleyi*, *Schæmus distichus*, *Gahnia javanica*, *Actinoschæmus*, *Scleria carphiformis*, and the two *Nepenthes*, *Singalana*, var. *alba*, and *N. gracillima* are also abundant. *Habenaria zosterostyloides* (a dwarf form) is common also, and looks very different from the tall form in the woods. *Spathoglottis aurea* and *Arundina speciosa* occur more sparingly.

On the rocks where quite bare grow the following orchids:—*Platyclinis linearifolia*, *Bromheadia rupestris* and *B. pungens*, *Tylostylis pulchella*, *Ceratostylis gracilis*, and *Dendrobium rupicolum*. The peculiarity of this flora is shown in the dwarfing of the plants, which in many cases also take on a peculiar yellow colour. This is specially noticeable in *Tylostylis* and the *Ceratostylis*. The rock form of this latter is short, thick, and fleshy, quite erect, and entirely yellow. I found it also in the Teku woods, with slender, soft, pendulous, green stems. The same yellow colouring appears in *Agathis flavescens*, of which the leaves and branches of the trees growing in the open Padang exposed to the full sun are of the same yellow colour, while in the woodland trees the leaves are green. The peculiar ochre-yellow of these plants is represented in the plain country in *Dischidia Rafflesiana*, when it grows (as it usually does) on dying, nearly leafless trees in sunny places by the sea. The flora of the Padang is typically xerophytic, the foliage being stiff and hard, on the whole.

Here and there are damper spots with a little accumulation of soil, and we find besides most of the shrubs here mentioned some additions: *Podocarpus neriifolius*, a curious variety with deflexed leaves, looking as if it was withered; *Dacrydium Beccarii*, which occurs, too, on the drier parts, but less abundantly, and its parasite *Arceuthobium*, *Burmanna disticha*, *Calogynes* creeping over old stumps, *Isachne javana* (the only grass here), *Rhynchospora glauca*, *Lycopodium carolinianum*, and *Eriocaulon silicicolum*. This *Eriocaulon* is replaced in the higher and drier spots by *E. Hookerianum*, which is evidently closely allied, but is a much condensed plant, with short, stiff, coriaceous leaves. I should be quite prepared to find these two species passing into each other, the latter being a mountain or subalpine form. In these damp spots on the Padang occurs the *Pandanus* (*P. Klossii*) as a dwarf stout plant, unbranched, about 8 or 9 feet tall. In the dense woods it attains a much greater height and is more slender and weaker.

THE PADANG WOODS.

The margins of the streams are fringed with dense woods for the most part, the thickest part of the woods with the largest trees being near the source. The trees, however, are by no means large, few reaching to 60 feet tall. These woods run up to nearly 6,000 feet altitude; at one point on the Teku River at 4,500 feet the forest is much larger and the trees bigger. I will speak of these Teku woods later.

In some parts of the Padang woods the forest consists of small trees 2 or 3 inches through, and so close that there are only a few inches between them. It is impossible to get through these without cutting one's way every step. The ground is covered with dense deep moss, in which grows *Cypripedium Robinsonii*, *Elaphoglossum decurrens*, *Geostachys elegans*, *Protolirion*, *Nepenthes Macfarlanei*, *Burmannia longifolia*, etc.: while on the trees are *Dendrobium hymenopterum*, *Bulbophyllum rostratum*, *B. galbinum*, *Phreatia crassifolia*, and *Oberonia condensata*, magnificent plants of *Cælogyne Dayana*, var. *Massangeana*, and the pretty little *Bulbophyllum Skeatianum*. In the more open spaces over the streams we find *Schima noronhæ*, *Ilex patens*, *Altingia* sp., *Pieris ovalifolia*, *Melastoma* sp., and *Rhododendron jasminiflorum*.

On the stream edges lined with mosses and hepatics we find the three little *Utricularias*, and here, too, grow *Xyris grandis*, *Argostemmas*, and on the stones, in such a position that they must be often submerged, are *Anerincleistus fruticosus*, *Scirpus Clarkei* and *Rhuacophila*. The ferns of this district are all of a xerophytic type—*Dipteris*, *Matonia*, *Polypodium*, and *Gleichenia*,—the hygrophytic *Lastræa* and *Alsophila*, with the *Selaginellas*, being confined to the damp forests or to wet shady banks.

Of Cryptogams I collected a good many mosses and hepatics, but have been unable to work them out at present. Mosses are extremely abundant, at least in amount, the damp forests by the stream edges being deeply carpeted with them, and in some of the cold dark woods just above the Gully and on the Padang the trees are draped in curtains of olive-coloured mosses. Hepaticæ are abundant by the stream. Lichens are less conspicuous, with the exception of *Usnea dasypoga*, which drapes the bushes of *Boeckia* and other shrubs in the bleakest and windiest spots, and *Cladonia macilenta* and *rangiferina*, which form clumps on the ground. Epiphyllous lichens occur on coriaceous leaves in the woods, but are by no means as common as in the low country.

Fungi are conspicuously scanty, and, from the remarkable duration of dead sticks on the Padang, seem to be actually very few in number. Some of the sticks erected by Mr. Robinson in 1906 for surveying purposes seemed to be quite sound and undecayed.

I found one fructification of the common *Polystictus igniarius* at the Camp, which may have been brought up

accidentally on sticks etc. from below, and two or three fructifications of a species of *Fomes* or *Polyporus* in the Teku Woods, but that was all, except, perhaps, a few leaf-fungi in an imperfect state.

In damp spots on the Padang were very conspicuous masses, 2 or 3 inches long, of a brilliant orange-scarlet alga forming small pads.

TEKU RIVER WOODS.

The Teku River commences by the junction of two streams from the watershed of the actual Tahan Mountain, and traverses the Padang through a deep gorge with precipitous sides, eventually joining the Tahan River at Kuala Teku. At the point where it enters the gorge it is joined by the stream that, in descending from the Ulu Riang Mountain, traverses the Padang from north-east to south-west. This stream I have called the Camp stream, because the Camp is placed close to it. This part of the Teku River contains a number of plants which are much more characteristic of the forest-region of the lower Tahan River, and which have not spread up the Padang stream for more than a few yards, such as *Homolomena angustifolia*, *Scindapsus Scortechinii*, *Dipteris Lobbiana*, *Loxocarpus incana*, and *Eurya acuminata*; and the forest which borders the Teku River in this locality, which is of a larger type of tree and more resembles in appearance the forests of the lower Tahan, contains such lowland types as *Plectocomia*, *Freycinetia*, *Curculigo*, *Phyllagathis hispida*, *Polyalthia*, and *Labisia pumila*.

Here we have, it seems, a flora pushing its way up the Teku River from the low country up to an altitude of about 4,600 feet, where it seems to stop. Along the stream we have also a number of plants of Himalayo-Japanese distribution—*Bucklandia*, *Altingia*, and *Itea*.

The last two genera have not been previously met with in the Peninsula. The number of Himalayo-Japanese plants over this region is small, especially when one compares it with the number found in some other parts of the Peninsula, such as Telôm, where occur *Viola*, *Sanicula*, *Sarcopyramis*, and *Disporum*. *Itea* occurs on Kinabalu, and the other two genera above mentioned probably had a very much wider distribution in earlier days and have disappeared except in isolated spots.

Except for these plants the Teku Woods flora seems to be composed of plants from the Tahan valley woods, mixed with a number which have descended from the plateau.

ORIGIN OF THE FLORA.

The flora of this mountain is evidently derived from more than one source, and the distribution of the genera and species found there is very instructive. We have naturally a large Malayan element—that is to say, the element of species and genera which occur chiefly or almost exclusively in Malayan regions. Many of the endemic species of this and

others of our higher mountains appear to be species of the lower country which, having found their way to the tops of the mountains and being able to maintain themselves there, have become modified into alpine forms or adapted in one way or another for life under mountain conditions.

These plants with Malayan affinities are:—

<i>Polyalthia pulchra</i> , King	<i>Webera</i> .
<i>Calophyllum venustum</i> , King	<i>Lasianthus</i> .
<i>Garcinia monantha</i> , Ridl.	<i>Cephaelis</i> .
<i>Adinandra</i> .	<i>Pentaphragma</i> .
<i>Elæocarpus</i> .	<i>Embelia myrtillos</i> .
<i>Evodia</i> .	<i>Ardisia</i> .
<i>Gomphandra</i> .	<i>Symplocos</i> .
<i>Salacia perakensis</i> , King.	<i>Alyxia</i> .
<i>Euonymus javanicus</i> , Bl.	<i>Gaertnera</i> .
<i>Parinarium</i> .	<i>Gesneraceæ</i> .
<i>Pygeum</i> .	<i>Nepenthes</i> .
<i>Polyosma</i> .	<i>Balanophora</i> .
<i>Carallia</i> .	<i>Loranthus</i> .
<i>Melastoma</i> .	<i>Henslowia</i> .
<i>Anerincleistus</i> .	<i>Cinnamomum mollissimum</i> .
<i>Oxyspora</i> .	<i>Choriophyllum</i> .
<i>Sonerila</i> .	<i>Orchideæ</i> (all).
<i>Phyllagathis</i> .	<i>Dischidia</i> .
<i>Medinilla</i> .	<i>Camptandra</i> .
<i>Begonia</i> .	<i>Geostachys</i> .
<i>Heptapleurum</i> .	<i>Curculigo</i> .
<i>Argostenma</i> .	<i>Sciaphila</i> .
<i>Urophyllum</i> .	<i>Araceæ</i> .
<i>Timonius</i> .	<i>Gnetum</i> .

In the case of the genera of world-wide distribution, those included in this list, e.g. *Begonia* and *Ardisia*, are represented by species either occurring in or allied most closely to the species in the forests of the lower zone.

A number of these species have obviously crept up the Teku rivers or Tahan rivers, occurring in the adjacent lower country, such as the *Gesneraceæ*, *Araceæ*, and *Melastomaceæ*; some, like the *Loranthi* and *Ardisia*, have drupaceous fruits constantly dispersed by birds and easily borne to these heights.

It is interesting to note that practically all the plants with seeds easily borne by wind, like *Dischidia*, *Orchideæ*, *Sciaphila*, and the vascular Cryptogams, are Malayan forms, with the one exception of *Lycopodium Carolinianum*.

Comparatively few of our highest mountains here have been thoroughly explored as yet—perhaps the best known are Mt. Ophir and Kedah Peak. The former, small as it is, bears a number of plants which are almost or quite peculiar to this mountain and Gunong Tahan. A list of those common to both will be of interest:—

<i>Illicium cambodianum</i> , Hance.	<i>Spathoglottis aurea</i> , Lindl.
<i>Anneslæa crassipes</i> , Hook. fil.	<i>Arundina speciosa</i> , Bl.

- Ilex Griffithii*, Hook. fil.
Euonymus javanicus, Bl.
Weinmannia Blumei, Planch.
Rhodoleia Teysmanni, Miq. Also
 Kedah Peak and Telöm.
Boeckia frutescens, L.
Leptospermum amboinense, Bl.
Rhodamnia trinervia, Bl. (mountain form).
Pachycentria tuberculata, Korth.
Psychotria sarmentosa, Bl.
Rhododendron malayanum, Jack.
Rhododendron jasminiflorum,
 Hook. fil.
Leucopogon malayanus, Jack.
Embelia myrtillus, Kurz.
Dischidia albida, Griff.
Nepenthes sanguinea, Lindl.
Balanophora multibrachiata,
 Fawc.
Loranthus Lobbii, Hook. fil.
Henslowia Lobbii, Hook. fil.
Podocarpus neriifolius, Don.
Dacrydium Beccarii, Pilq.
Platyclinis linearifolia, Ridl.
Dendrobium uniflorum, Griff.
Eria nutans, Lindl.
Eria monticola, Hook. fil.
Ceratostylis gracilis, Bl.
- Bromheadia rupestris*, Ridl.
 Also Kedah Peak.
Bromheadia pungens, Ridl.
Habenaria zosterostyloides,
 Hook. fil.
Apostasia nuda, Lindl.
Geostachys elegans, Ridl.
Curculigo latifolia, Dryand.
Burmammia disticha, L. Also
 Kedah Peak.
Actinoschæmus.
Cladium Maingayi, Clarke.
 Also Kedah Peak.
Lepidosperma chinense, Nees.
 Also Gunong Kerbau.
Gahnia tristis, Nees.
Isachne javana, Nees.
Gleichenia circinata, Sw.
Matonia pectinata, Br.
Dipteris Lobbiana, Hook.
Lastræa viscosa, Bl.
Polypodium hirtellum, Bl.
Polypodium parasiticum, Mett.
Polypodium cucullatum, Nees.
Polypodium malaccanum, Bak.
 Mt. Ophir only.
Chrysodium bicuspe, Hook.
Schizæa malaccana, Bak.

A good many more widely distributed ferns also occur on both mountains.

On Kedah Peak occur five plants which have not yet been met with elsewhere than on Gunong Tahan. These are *Hedychium collinum*, Ridl., *Dendrobium hymenopterum*, Hook. fil., *Xyris Ridleyi*, Rendle, *Scleria carphiformis*, Ridl., and *Eria lorifolia*, Ridl.

It is probable that further exploration may show their occurrence in intermediate stations.

COMPARISON WITH MOUNT KINABALU IN BORNEO.

The flora of the high mountain Kinabalu has been well worked up from the collections of Dr. Haviland and Low by Dr. Stapf in the 'Transactions of the Linnean Society, Botany,' and we find the following species common to this mountain and to Gunong Tahan:—

- Itea macrophylla*, Wall.† *Eriocaulon Hookerianum*,
Clethra canescens, Reinw.† Stapf†.
Leucopogon malayanus, Jack. *Scirpus Clarkei*, Stapf†.
Gentiana† (*G. malayana* being *Podocarpus cupressina*, R. Br.
 closely allied to *G. Borneensis*). *Dacrydium elatum*, Wall.

Burmannia longifolia, Becc.*Eria ferox*, Bl.*Spathoglottis aurea*, Lindl.*Smilax laevis*, Wall.*Podocarpus neriifolia*, Don.*Lycopodium ceylanicum*,
Spring.*Lycopodium casuarinoides*,
Spring.

The plants marked † have not yet been found in any part of the Malay Peninsula, except on Gunong Tahan. I have in this list excluded the Ferns, which are mostly widely distributed. There are also a number of species on Gunong Tahan very closely allied to species on Kinabalu, such as *Rhododendron elegans*, Ridl., allied to *R. cuneifolium*, Stapf; *Psychotria densiflora*, Stapf, allied to *Ps. condensata*, King.

The occurrence of these plants seems to show a former land-connection with Kinabalu, as many are species which have neither drupaceous (bird-borne) or wind-borne seeds.

ABSENCE OF THE HIMALAYAN ELEMENT.

As shown in a paper on the flora of the Telôm valley in Perak, we have there a distinct Himalayo-Javanese element represented by such plants as *Viola*, *Sanicula*, *Surcophyramis*, and *Disporum*. This type of flora seems to be remarkably absent from the Tahan region, as it is from Mt. Ophir and Kedah Peak.

We have, it is true, a series which seem to have come from the Himalayas, but are also Burmese and occur elsewhere in the Peninsula, e.g. *Pyrus* and *Eriobotrya*; *Hedychium collinum*, allied to a species from Burmah and also occurring on Kedah Peak, seems to have crept downwards from the north. The Hamamelideæ (*Bucklandia* and *Altingia*) and the Saxifragaceæ (*Itea*) also occur in the Himalayas and Java.

THE AUSTRALIAN ELEMENT.

All through the Malay Peninsula we find scattered a number of plants which have at least affinities with plants characteristic of Australia or belong to characteristic Australian genera. A greater part of this class of plants disappears north and west of the Peninsula, being absent from the Indian and Ceylon regions.

In the Malay Peninsula they occur on the sea-shore and on the higher parts of the mountains, being absent from the intervening forest-regions. They persist, in fact, in our only xerophytic districts—the sea-coasts and the more xerophytic parts of the higher mountains. They are missing from the wet forest-hills of Perak, although the altitude of these hills is as high or often higher than the xerophytic zone of Mt. Ophir, where they occur.

All, or almost all, of these Australian plants have been met with in similar localities in the islands lying east of the area lying between the Malay Peninsula and Australia, and with an increasing number of species the nearer we get to Australia.

Thus the Australian element is larger on Kinabalu than on Gunong Tahan, and it appears to be larger in New Guinea than on Kinabalu.

On our sea-coasts in the Peninsula we get *Spinifex squarrosus*, *Casuarina equisetifolia*, *Dianella*, *Melaleuca leucadendron*, *Pittosporum ferrugineum*, *Rhodamnia trinervia*, *Phillydrum lanuginosum*, and several species of *Tristania* and *Helicia*.

On Gunong Tahan at high elevations we find *Boeckia frutescens*, *Leptospermum*, *Rhodamnia*, *Tristania*, *Leucopogon*, *Pittosporum*, *Helicia*, *Cryptostylis*, *Dianella*, *Gahnia*, *Schænus*, *Lepidosperma*, *Dacrydium*.

In Borneo, besides these plants, we find *Drimys*, *Drapetes*, *Paterosonia*, *Coprosma*, *Trachymene*, *Havilandia* (a genus allied to the Antarctic species of *Myosotis*), *Euphrasia*, and *Ranunculus*, allied to Australian and New Zealand species.

Most of these Bornean plants which do not, as far as is known, occur on any of the Malay Peninsula mountains occur only on Kinabalu at a greater altitude than any of our mountains rise to, and this is probably the cause of their absence.

Such of the mountain genera of Australian origin as can thrive near the sea occur in both localities, such as *Boeckia* on sea-shore rocks in Borneo, *Rhodamnia*, *Tristania*, *Leucopogon* (sea-shores in Singapore and Labuan), *Dianella*, *Gahnia tristis*, *Schænus*, and *Pittosporum*.

One is forced to conclude that at one period there was extending from the Australian region an extensive xerophytic area, which bore an Australian flora. That, probably owing to climatic changes, this flora was swamped by a typical Malay forest-flora of the rain-forest or hygrophytic type, so that all that remains to us are such species as could persist in the only xerophytic regions we possess—the sandy sea-shores and drier mountain-tops.

The rocks of Gunong Tahan have been examined by Mr. Scrivenor, who considers them to be Estuarine and dates them as having probably been deposited between the Rhætic and Inferior Oolitic periods. The flora now on this ground, of course, is of much later date than this, but the sands of these ancient Estuarine beds have been much altered, formed into rock and upheaved, and it must have been at a very much later period that these Australian or far Eastern plants crept along over its surface.

The similar plants occurring on Mt. Kinabalu are believed to have migrated there in Tertiary times (Stapf, 'Flora of Mt. Kinabalu').

I would suggest that the history of this flora was somewhat as follows:—

A big river existed in Northern Pahang, which deposited sand at its mouth which eventually became hardened into rock and elevated as time went on to considerable altitude, and formed the great mass of mountains known as Gunong Tahan

and was connected in the form of cool dry tableland with Mt. Kinabalu on one side and Gunong Kerbau and Mt. Ophir on the other. This tableland was—at least, in part—of granite, for both Kinabalu and Mt. Ophir are of granite. This was the state of affairs in Tertiary times, when this Australian flora, of which we have these few relics left, covered this country.

PLANTS OF THE MOUNTAIN ABOVE 3,300 FEET.

POLYPETALÆ.

ANONACEÆ.

1. *POLYALTHIA PULCHRA*, *King*; *antea*, p. 43. Woods by the Teku River at 4,600 feet altitude.

Distribution. Gunong Bubu and Gunong Kerbau, 4,200 feet.

This is here a moderate-sized tree with large leaves, and flowers 3 inches across, pendulous from the ends of the branches, yellowish white with a purple blotch at the base. It differed a little from the type-form in having the base of the sepals on the back and the petals pubescent. The flowers, though large, can hardly be said to be very beautiful, as their colouring is dull; but they possess the most extraordinarily strong perfume of *Magnolias*, so powerful that I could easily perceive the odour after the flowers were put in the collecting-book and carried some yards away.

POLYGALACEÆ.

*2. *POLYGALA MONTICOLA*, *Ridley*, *Journ. Linn. Soc., Botany*, xxxviii. p. 303 (1908); *antea*, p. 44. Common in the woods of the Padang. This pretty shrublet varies in size, and is not rarely branched. The flowers are white, with the petals deep rose-pink. The capsule is flattened, usually purple when ripe, the small black seeds enclosed in an orange-scarlet aril.

Distribution. Gunong Semangko, Gunong Bubu, Gunong Kerbau, 6,000 feet, and Benom.

PITTOSPOREÆ.

*3. *PITTOSPORUM* sp., *Ridley*, *op. cit.* p. 303. This plant, first collected by Robinson, is not rare in the open woods on the Padang, but no trace of flowers or fruit were to be seen.

GUTTIFERÆ.

*4. *CALOPHYLLUM VENUSTUM*, *King*; *Ridley*, *op. cit.* p. 304. A common small tree, about 20 feet tall, in open woody places on the Padang, at 5,600 feet elevation.

Distribution. Perak.

5. *GARCINIA MONANTHA*, n. sp.

A small tree, the bark of the branches grey. Leaves coriaceous, ovate or lanceolate-ovate, acuminate, acute, cuneate, 3 inches long, 2 inches wide; nerves 25 pairs, invisible

*Species thus marked occur in the original collection from this mountain (Journal Federated Malay States Museum 11 pp. 107-142 (1909).

above and indistinctly marked beneath; petiole thick, half an inch long. Male flowers not seen. Female flowers axillary, solitary, on short stout peduncles a quarter of an inch long, with several small ovate acute bracts; pedicel short and stout; perianth caducous; ovary $\frac{1}{4}$ inch long, with a rather large, circular, entire fleshy stigma.

Woods on the banks of the streams, Padang.

The only plant seen was past the flowering stage, and description is necessarily very incomplete, but it is so distinct that I venture to describe it. In the solitary axillary flowers it resembles *G. uniflora*, King, but it is very distinct in its smaller, ovate, very coriaceous leaves, in which the nerves are very much more numerous.

TERNSTRØMACEÆ.

*6. *ANNESLEA CRASSIPES*, Hook; Ridley, *op. cit.* p. 304. Common on the ridges from 3,300 feet to the Padang at 6,000 feet; a small tree or shrub, in fruit at this time, the fruiting calyx red.

Distribution. Hills of Mt. Ophir and Perak.

*7. *ADINANDRA VILLOSA*, Choisy; Ridley, *op. cit.* p. 304. Collected by Robinson at 5,000 to 5,600 feet. I did not see this plant on this occasion.

Distribution. Perak and Tavoy.

*8. *ADINANDRA ANGULATA*, Ridl. *op. cit.* p. 304. Originally collected by Robinson in this locality. I met with it in the woods near the Teku River at 4,600 feet elevation; a big tree for the genus. The flowers are white and large, the bud conical, half an inch long. The sepals ovate, glabrous, imbricate, with rounded tips $\frac{1}{4}$ inch long. Petals lanceolate, thick and fleshy. Stamens numerous, $\frac{1}{4}$ inch long; filament flat, rather broad, nearly glabrous; anthers acuminate, covered with long hairs; ovary ovoid-conic, tapering into the style, glabrous. Endernic.

*9. *GORDONIA IMBRICATA*, King; Ridley, *op. cit.* p. 305. A shrub or bush only a few feet tall usually, the flowers creamy white. The petals are rather peculiar in having a brown coriaceous patch on the back.

I found a plant with broadly fasciated branches on the Padang across the Teku. It is plentiful from the ridges just above Wray's Camp to the Padang at 6,000 feet altitude.

*10. *SCHIMA NORONHÆ*, Reinw. dt.; Ridley, *op. cit.* p. 305. A fairly large branched tree on the banks of the camp stream on the Padang, in flower up to nearly 6,000 feet.

Distribution. Hills of Burmah, the Malay Peninsula and islands.

*11. *PENTAPHYLAX MALAYANA*, Ridl. *op. cit.* p. 305. Very common on the upper ridges and on the Padang, and very conspicuous from its bright red terminal leaves forming conspicuous patches of colour all over this district. It is a

bush or a small-sized bushy tree. Endemic; the only other species of the genus occurs in China.

12. *EURYA ACUMINATA*, var. *EUPRISTA*. A common large shrub in the rocky stream of the Teku, and less bushy on the streams on the Padang, where it is less common. This shrub is very abundant all up the Tahan River, and seems to have found its way up thence.

Distribution. Himalayas to Fiji.

*13. *TERNSTRÆMIA MACLELLANDIANA*, n. sp.; *antea*, p. 44. *Ternstræmia japonica*, Ridley, op. cit. p. 304.

A small tree about 20 feet tall. Leaves thickly coriaceous, drying olive-green above, yellowish beneath, oblanceolate, shortly acuminate and narrowed at the base, more rarely obovate-obtuse, $3\frac{1}{2}$ –5 inches long, 1–2 inches wide; nerves three pairs, hardly visible below, invisible above; midrib prominent below, grooved above; petiole stout, $\frac{1}{4}$ inch long. Flowers from the axils of the upper leaves, solitary in the axil; pedicels thick, decurved, $\frac{1}{2}$ inch long. Calyx with 5 short rounded lobes, $\frac{1}{8}$ inch long, much shorter than the corolla. Corolla half an inch across, white; petals 5, oblong at the base, then obovate, rounded, margins denticulate. Stamens numerous, subsessile, short; anthers longer than the filament, oblong-truncate, rather broad.

Not rare on the Padang. Endemic.

Most nearly allied to *T. Scortechinii*, King, a Malayan species, but with a hardly lobed calyx and different leaves with fewer nerves.

I referred this in the previous paper to the *T. aneuira*, Miq., of Banka, which is referred to a variety of *T. japonica*, Thunb., by Hooker. It differs, however, in the much smaller calyx and the almost clawed petals from *T. japonica*. I am pleased to associate this plant with the name of Mr. F. A. S. McClelland, District Officer of Kuala Lipis, who assisted us very materially in making the expedition.

TILIACEÆ.

*14. *ELÆOCARPUS MONTICOLA*, *Ridl. op. cit.* p. 305. Common small tree on the Padang. Endemic.

15. *ELÆOCARPUS RETICOSA*, n. sp.

A small tree, the young parts pubescent. Leaves ovate, abruptly acuminate, acute to lanceolate-acuminate, base rounded, margin thickened, faintly crenulate, with small black processes in the crenulations, stiffly coriaceous, 2 to 4 inches long, 1 to 2 inches wide; main nerves seven pairs, branching and inarching within the margin, polished yellow-brown, strongly reticulate above when dry, and similarly reticulate, with numerous black dots beneath; young leaves red and minutely pubescent on the petiole and midrib beneath; petiole $\frac{1}{2}$ inch long, decurved, pubescent. Panicles from the lower or median leaf-axils, $1\frac{1}{2}$ to 2 inches long; branches and pedicels pubescent. Sepals and petals not seen. Stamens with linear

anthers on very short filaments, glabrous. Torus covered with short stiff white hairs. Fruit ellipsoid, $\frac{1}{2}$ inch long, blue-black. Tree on the Padang, young leaves red; out of flower.

A very distinct species in its coriaceous closely netted leaves.

RUTACEÆ.

*16. *EVODIA SIMPLICIFOLIA*, *Ridl. op. cit.* p. 306. A shrub, rather scarce, in fruit only on the Padang. Endemic.

17. [*EVODIA PACHYPHYLLA*, *King*. Occurs on the ridge above Wray's Camp.]

TERMINTHODIA, gen. nov.

A shrub or small tree. Leaves alternate, unifoliate, articulate on the petiole, glandular, subcoriaceous, obovate, obtuse. Flowers in axillary corymbs, small, green; calyx 4-lobed, lobes rounded. Petals 4, triangular; disc large, 4-angled; gland dotted. Stamens 4; filaments, subulate, short; anthers small. Ovary 4-lobed, protruding from the disc. Style central; stigma small, capitate. Ripe carpels 1 to 3 developed, boat-shaped, dehiscing along the inner edge. Seeds two in each carpel, small, flattened and winged, pale brown, exalbuminous.

Species one.

18. *TERMINTHODIA VIRIDIFLORA*, n. sp.

A bush 3 or 4 feet tall, occasionally developing into a treelet about 15 feet or more tall; bark wrinkled, dark. Leaves alternate, crowded at the end of the branches, unifoliate, subcoriaceous, bright green, aromatic, obovate, with a rounded entire or retuse apex, or shortly acutely acuminate, nerves about five or six pairs, faintly visible above, elevate beneath, inarching within the margin, paler beneath, and profusely gland-dotted, 2 to 3 inches long, $1\frac{1}{2}$ to 2 inches wide; petiole $\frac{1}{2}$ inch long, articulate with the leaf. Flowers in small pubescent panicles shorter than the leaves, in the upper axils, panicles $\frac{1}{2}$ inch across on a peduncle $1\frac{1}{2}$ inch long. Bracts small, one-tenth inch long, lanceolate-ovate, acute. Sepals 4, rounded, imbricate, pubescent, green. Petals longer, 4, triangular acute, spreading, glabrous, $\frac{1}{8}$ inch long, darker green. Disc large, 4-angled, flat, gland-dotted. Stamens 4, alternate with the petals and nearly as long; filaments thick, subulate. Anthers very small. Ovary protruding from the disc, 4-lobed. Style central. Stigma very small, cocci 1 to 3 usually developed, $\frac{1}{4}$ inch long, boat-shaped, obtuse, green, reticulate when dry. Seed very small, winged, ovoid or obovate, thin, flat, apex rounded, $\frac{1}{8}$ inch long.

Common on the Padang in rocky places. The leaves have a strong turpentine odour when crushed.

This plant is allied to the genus *Evodia*, but differs in its alternate leaves, large square flat disc, and its thin-winged flat seed. There is a distinct line between the lamina of the leaf

and the petiole, but the leaf does not disarticulate when falling. The flowers seem to be always hermaphrodite. I have found bushes in which the flowers were replaced by a globose mass of minute green bracts.

OLACINEÆ.

19. GOMPHANDRA PUBERULA, n. sp.

A shrub with slender branches, pubescent, with yellowish hairs in the young parts. Leaves ovate, acuminate, apex blunt, base slightly narrowed, rounded, thinly coriaceous, nerves 6 pairs, distant, conspicuously interarching well within the margin, indistinct above, elevated beneath, above glabrous, shining beneath, midrib pubescent with yellowish hairs, appressed, the rest covered with profuse scattered short hairs from black tubercles, caducous in older leaves, 3 to 4 inches long, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches wide; petiole yellow, hairy, $\frac{1}{8}$ inch long. Cymes from the lower axils, peduncles $\frac{1}{2}$ inch long with a few short branches. Calyx small, cupular, with 5 small points. Flowers not seen. Fruits fusiform, slightly narrowed at each end, grooved on one side, crowned with round discoid stigma, $\frac{1}{2}$ inch long, $\frac{1}{4}$ inch through, 1-celled and 1-seeded. Seed oblong-ellipsoid, straight, not flattened.

Woods on streams, Padang.

This appears to be nearest to *G. nyssifolia*, King, but with smaller leaves.

ILICINEÆ.

20. ILEX GRIFFITHII, *Hook. fil.* A shrub on the Padang and more common on the ridges. Common in the mountains of the Peninsula at an altitude of 4,000 feet, also in Sumatra (*Forbes*).

21. ILEX RUPICOLA, n. sp.

A shrub with elliptic, obtuse, or subacute coriaceous leaves, rounded at the base, 2-2 $\frac{1}{2}$ inches long, 1-1 $\frac{1}{4}$ inch wide, above smooth, shining; nerves invisible, midrib channelled beneath, glaucescent, midrib prominent, nerves faint, 4-5 pairs; petiole thick, $\frac{1}{8}$ inch long. Panicle shorter than the leaves terminal, $\frac{1}{2}$ inch long, and about as wide, of about six branches. Flowers about 8, subumbellate on the branches, on pedicels $\frac{1}{10}$ inch long, small, white. Sepals orbicular, imbricate, 5, margins ciliate. Petals 5, oblong, hardly connate at the base, edges ciliate. Stamens 5, glabrous; filament short, thick, forming a keel on the back of the elliptic broad anther. Style short, single. Ovary conic. No disc. Fruit globose, $\frac{1}{8}$ inch long, terminated by a short cylindric style-beak. Pyrenes four.

Padang, Gunong Tahan.

Most nearly allied to *I. epiphytica*, King, differing in the foliage and terminal panicle.

22. ILEX EPIPHYTICA, *King; antea*, p. 45. On the Padang at 5,600 feet altitude.

Distribution. Perak; (Gunong Kerbau 4,500-6,600 feet).

23. *ILEX PATENS*, n. sp.

A tree with spreading branches; bark black. Leaves alternate, dark green, thinly coriaceous, ovate, entire, obtuse, rounded or slightly narrowed at the tip, base rounded, 2 to 3 inches long, $1\frac{1}{2}$ to 2 inches wide, smooth, glabrous, shining above, lighter beneath; nerves 4 to 5 pairs, almost invisible above, slightly elevate beneath; midrib prominent beneath; petiole $\frac{1}{4}$ inch long. Flowers cymose on peduncles, as long as the petiole, flattened, grooved, occasionally branched, about 5 flowers on a cyme, nearly as large as those of *I. glomerata*, King, white or pale pink. Calyx-lobes 4 or 5, rounded, glabrous. Petals connate at the base, 4; apex rounded. Stamens 4, adnate to the base of the petals; filaments short, white; anthers black. Ovary conic. Fruit globose, with a short rounded style-beak, $\frac{1}{4}$ inch long when ripe, on wider-spreading cymes.

Woods along the stream at the Ninth Camp.

A pretty tree, allied to *I. glomerata*, King, but the petals shorter and the cymes borne on peduncles.

CELASTRACEÆ.

*24. *SALACIA PERAKENSIS*, King; Ridley, *op. cit.* p. 306. Gunong Tahan at 5,000 feet (Robinson), not seen again. Previously collected by Scortechini in Perak.

25. *EUONYMUS JAVANICUS*, Bl; *antea* p. 45. Woods near the Camp stream and on other streams near the Padang.

Distribution. Burmah, Malay Peninsula and islands.

ROSACEÆ.

*26. *PYRUS GRANULOSA*, Bertol.; Ridley, *op. cit.* p. 306. Padang, open woods and borders of streams.

Distribution. Khasiya, Burmah, Sumatra, Malay Peninsula.

27. *ERIOBOTRYA BENGALENSIS*, Hook. fl. A small little-branched treelet with few branches. The leaves more coriaceous and ovate than usual, red when young; flowers white, deliciously fragrant. This is the plant described as *Photinia dubia*, Wall, in previous lists, from which it was separated by Hooker. It occurs in the East Himalayas, Tenasserim, and in the Malay Peninsula.

28. *PARINARIUM COSTATUM*, Bl., var. *RUBIGINOSUM*. A tree about 20 feet tall; the panicles are denser and the stem, backs of the leaves, and flowers more densely covered with ferruginous hairs.

In a wood on the Padang across the Teku.

Distribution of type. Malay Peninsula and Java.

29. *PYGEUM RUBIGINOSUM*, n. sp.

A small bushy tree. Leaves ovate, acuminate, base rounded or retuse, $1\frac{1}{2}$ inch long, $\frac{3}{4}$ inch wide, above smooth, glabrous except the depressed midrib, beneath paler, sparsely hairy except the nerves 6-7 pairs and midrib covered with

rufous appressed hairs, as is the leaf-margin; petiole thick, $\frac{1}{8}$ inch long, rufous, hairy when young. Racemes short, very dense, rufous hairy, under $\frac{1}{2}$ inch long. Bracts oblong-ovate, obtuse, rufous hairy, $\frac{1}{10}$ inch long. Pedicels very short. Calyx campanulate, $\frac{1}{8}$ inch long, with ten very small lobes, all densely red hairy outside. Petals none. Stamens glabrous; filaments slender, red, adnate to the mouth of the calyx-tube. Anthers small, subglobose. Pistil conic, covered with white silky hairs. Style fairly stout. Stigma capitate.

On the Padang and ridges, 5,000–6,000 feet altitude.

Allied to *P. brevifolium*, Hook. fil., of Mt. Ophir, but with different leaves, ovate and very hairy, as are the young branches.

30. PYGEUM PATENS, n. sp.

A treelet about 20 feet tall; branches red, scurfy. Leaves ovate-cuspidate, coriaceous, base rounded, margin entire, above smooth, glabrous, nerves sunk, beneath paler, sprinkled over with short dark hairs, midrib and main nerves 9–11 elevated, red, scurfy, reticulations conspicuous, red, scurfy, 6 inches long, 3 inches wide. Petiole thick, red, scurfy, $\frac{1}{4}$ inch long. Flowers in small facicles, shorter than the petiole. Bracts small, ovate; peduncle and calyx densely ferruginous, hairy. Flowers minute, $\frac{1}{10}$ inch long. Calyx cupular, with very short lobes, densely hairy. Petals none. Stamens about 15, glabrous; filaments short. Anthers elliptic as long. Style thick, protruding shortly beyond the calyx, hairy. Stigma obscurely lobed, broader. Fruiting peduncle stout, $\frac{1}{4}$ inch long, hairy. Drupe transversely oblong, rounded, 2-seeded, $\frac{1}{4}$ inch long, $\frac{3}{8}$ inch wide, sparsely hairy.

Woods on Gunong Tahan, and below the Gully, not seen on the open Padang.

Allied to *P. Griffithii*, Hook. fil., of Mount Ophir, but the leaves are entire.

SAXIFRAGACEÆ.

*31. POLYOSMA CORIACEA, King, var. LANCEOLATA.

Polyosma coriacea, Ridley, *op. cit.* p. 307.

A small tree, with grey bark. Leaves narrow-lanceolate, glabrous, shining above, glaucous beneath, apex acuminate, base cuneate, nerves indistinct, seven pairs, 4 inches long, 1 inch wide. Raceme terminal, 3 to 5 inches long, rachis glabrous, pedicels $\frac{1}{10}$ inch long, slightly sprinkled with hairs. Calyx-lobes ovate-acute, longer than in the type.

Woods on the Padang (collected also by Robinson in the first expedition, No. 5388). At first sight this plant looks very different from the type-form, which has shorter and broader leaves, but it is connected with it by the next form.

*32. Var. INTERMEDIA. Leaves oblong-lanceolate, lighter in colour when dry, not glaucous beneath; flowers rather larger and calyx-lobes longer.

Woods on the Padang, also collected by Robinson (No. 5493).

*33. *P. LÆTE-VIRENS*, Griff.; Ridley, *op. cit.* p. 307. Padang woods. This form differs from the typical Penang and Perak plants in the larger fruit, which is nearly sessile, and the larger ovate hairy sepals.

34. *ITEA MACROPHYLLA*, Wall. A big tree on the banks of the Teku River, near its junction with the Camp stream. A new record for the Malay Peninsula. It occurs in the Himalayas and the Malay islands.

35. *WEINMANNIA BLUMEI*, Planch.; Ridley, *op. cit.* p. 306. Woods by the Camp stream. Common on all the hill-ranges over 4,000 feet.

HAMAMELIDÆ.

36. *BUCKLANDIA POPULNEA*, Br. Young trees in the Teku woods at 4,600 feet elevation.

Distribution. Temperate Himalayas, Burmah, Java, and Sumatra.

*37. *RHODOLEIA TEYSMANNI*, Miq.; Ridley, *op. cit.* p. 307. Common on the Padang, a low shrub here. The young leaves are red woolly beneath, becoming white beneath later.

Distribution. Mt. Ophir, Perak Mountains, and Sumatra.

38. *ALTINGIA EXCELSA*, Noronh. In the Teku woods at 4,600 feet altitude. Flowers white. A new record for the Peninsula. The tree occurs also in the Himalayas and Java.

RHIZOPHOREÆ.

39. *CARALLIA MONTANA*, n. sp.

A shrub about 8 or 10 feet tall. Bark black, branches bluntly angled, nodes dilated. Leaves only at the ends of the branches, obovate or elliptic ovate, shortly acuminate, blunt at the tip, cuneate at the base, margin thickened with minute, black, thorn-like processes, coriaceous, shining above, paler, profusely black-dotted beneath, nerves 7 pairs, slender, midrib grooved above, prominent beneath, 2 inches long, $1\frac{1}{4}$ inch wide; petiole stout, $\frac{1}{4}$ inch long, reddish. Cymes axillary, three-flowered; peduncle $\frac{1}{2}$ inch long; pedicels $\frac{1}{8}$ inch long. Flower $\frac{1}{4}$ inch long. Calyx-tube funnel-shaped; lobes triangular, acute, 5, coriaceous. Petals thin, ovate, laciniate, shorter than the sepals, clawed, white. Stamens 10; filaments thick, narrowed upwards. Anthers ovate, minutely cuspidate. Style thick. Stigma wider, discoid.

Gunong Tahan, common on the Padang. Also Kluang Terbang (coll. Barnes) and Gunong Kerbau in Perak (coll. Mohammed Aniff). Apparently allied to Miquel's *C. floribunda*, but with a very much reduced inflorescence.

MYRTACEÆ.

*40. *BAECKIA FRUTESCENS*, Linn.; Ridley, *op. cit.* p. 307; *Antea* p. 46. One of the commonest trees on the ridges and all over the Padang. In the open rocky places of the Padang it often takes the form of a prostrate shrublet only a few inches

high, and varies from that to a bush or, in the woods where the soil is richer, to a tree of considerable size, with a stem a foot or so through. The little flowers are white, with a greenish ring in the centre, which becomes red when the flowers have been open some time.

It is visited by the *Bombus*.

This plant has wide distribution over all our hills, where they are xerophytic, over 4,000 feet. It occurs also as a sea-shore plant on rocks in Borneo. The distribution is from China westwards.

* 41. *LEPTOSPERMUM FLAVESCENS*, Sm.; Ridley, *op. cit* p. 307. Common all over the Padang and along the ridges, forming on the Padang a low brushwood about 1 to 2 feet tall. It forms also bigger shrubs of a somewhat erect habit, but never seems to get as large as *Baeckia*.

Distribution. From Australia to the Malay Peninsula at high elevations.

* 42. *RHODAMNIA TRINERVIA*, var. *UNIFLORA*. A shrub about 12 or 14 feet tall with slender branches, the young parts silky. Leaves ovate, abruptly acuminate, base rounded, thinly coriaceous, entirely silky when young, glabrescent, shining above when adult and white silky beneath, the three nerves prominent beneath, with about eight pairs of secondary nerves at rather an acute angle, 2 to 3 inches long, $1\frac{1}{2}$ inch wide; petiole very short. Flowers few or solitary, axillary or terminal, sessile, $\frac{1}{8}$ inch across, white. Calyx obconic, silky, with short-ovate lobes. Petals white, glabrous, oblong-lanceolate; stamens short, just protruding from the calyx-tube. Berry globose, $\frac{1}{8}$ inch long, silky, terminated by the short-oblong calyx-lobes.

In low scrub at Wray's Camp and on the Padang.

Different as this plant is in appearance and in the solitary sessile flowers and the silky fruit from the long-leaved tree with small panicles of flowers and glabrous fruit, I conclude it to be an alpine form of this species. A shrub from Mt. Ophir (No. 3229 of my collections) much resembles this in foliage, but the flowers are more numerous, pedicelled, and not silky, with wider petals—in fact, an intermediate form between the typical lowland species and the Tahan one.

43. *EUGENIA STAFFIANA*, King. A tall shrub or treelet with bright green leaves and white flowers. On woods on the Padang across the Teku River. It occurs in the hills of Perak and Selangor.

* 44. *EUGENIA PAHANGENSIS*, Ridl. *op. cit.* 307. A big shrub; flowers tinted with pink. The fruit is an inch long, globose, and dull pink, and occasionally contains two seeds, Endemic.

45. *EUGENIA TAHANENSIS*, n. sp.

A shrub about 5 feet tall; bark black. Leaves stiffly coriaceous, obovate-obtuse, rounded at the top or shortly acute, base cuneate, $3\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches wide; nerves

5 to 7 pairs, very slender and obscure; midrib grooved above, thick and elevated beneath; the leaves dry pale brown, lighter-coloured beneath; petiole $\frac{1}{4}$ inch long. Cymes compound in the upper axils, 2 to 3 inches long; many-flowered, the branches obscurely angled. Pedicels short, oblong, angled. Flowers white, resembling those of the preceding species. Calyx-tube oblong-conic, $\frac{1}{4}$ inch long; lobes small, ovate. Petals small. Fruit oblong, globose; the base rounded, terminated by the short oval sepals.

Gunong Tahan at the top in a small woody patch, at 7,186 feet altitude.

This species is certainly allied to *E. Pahangensis*, but is distinct in its obovate leaves, narrowed at the base, and the much fewer nerves. The leaves are also less thickly coriaceous.

*46. *EUGENIA VIRIDESCENS*, *Ridl. op. cit.* p. 308. A shrub with buds white tipped with pink. Common on the Padang. Endemic.

47. *TRISTANIA FRUTICOSA*, n. sp.

Usually a small shrub about 3 or 4 feet tall, bushy; the bark red, flaking off. The leaves crowded, coriaceous, oblanceolate-obtuse, shortly narrowed towards the blunt tip and narrowed gradually to the base, dark green, drying greenish yellow above, yellow beneath, nerves 30 pairs, joining a fine intramarginal vein within the edge, midrib prominent beneath, 2 to 4 inches long, 1 to 2 inches wide; petiole thick, winged to the base, $\frac{1}{8}$ inch long. Cymes axillary and terminal, numerous, shorter than the leaves, 1 inch long; peduncle stout; pedicels short, thick. Flowers $\frac{1}{4}$ inch across, calyx-lobes 5, triangular, spreading. Disc large, flat. Petals obovate, clawed, small. Stamens numerous, filaments very short in fascicles; anthers small. Capsule $\frac{1}{4}$ inch long, dehiscing into three ovate lobes, on the remains of the calyx in the form of a flat spreading saucer. Seeds three in each cell, $\frac{1}{8}$ inch long, crescent-shaped or oblong-cuneate, flat, light brown.

Abundant on the Padang. In the thicker woods there were trees of larger size which may belong to this species, but I could get no flowers on these.

The species is allied to *T. Merguiensis*, but differs in the glabrous flowers and the shallow flat calyx with longer points.

MELASTOMACEÆ.

48. *MELASTOMA LONGISEPALA*, n. sp.

Melastoma malabathricum, *Ridley, op. cit.* p. 508.

A tall straggling bush about 12 feet tall. Leaves subcoriaceous, lanceolate-acuminate, shortly narrowed at the base, 4 inches long and 1 inch wide, glabrous above, beneath hairy on the nerves with broad flattened scalelike hairs, nervules finely hairy; petiole scaly, hairy, $\frac{1}{2}$ inch long, red. Flowers on pedicels $\frac{1}{4}$ inch long. Bracts 2, lanceolate-acute, red, $\frac{3}{4}$ inch long. Calyx $\frac{1}{2}$ inch long, covered with pale yellow scales;

lobes as long as the tube, linear-oblong, acuminate, cuspidate, hairy on the back and tip, smooth within, red. Petals light rose-colour, obovate, rounded, $\frac{3}{4}$ inch long; stamens 5, similar; filaments white at the base, jointed above, upper part curved, yellow with a 2-forked process at the base, apex violet; anthers violet, acuminate. Style bright red.

On banks of streams, Padang.

This has the habit of *M. sanguinea*, but the scale-hairs on the calyx are like those of *M. Malabathricum*.

49. *ANERINCLEISTUS ROBINSONII*, Ridl. *Journ. Straits Branch Roy. Asiat. Soc.* No. 57, p. 46 (1910). Common in the woods along the Teku River at 4,600 feet altitude. Flowers white. A shrub about 4 feet tall. Endemic.

50. *A. PULCHRA* (*Oritrephes pulchra*, Ridley, *op. cit.* p. 309). This plant was mixed with the preceding in the collections made by Robinson, and distributed under No. 5,509. The character of the genus *Oritrephes* was the baccate and apparently indehiscent fruit, not opening by valves at the apex. The fruit in the specimen first examined was apparently nearly ripe. Other specimens, however, now show that the fruit at a later stage does dehisce by valves as in a true *Anerinckleistus*, and that the plant is allied to *A. grandiflora*, Ridl., of the Semangkok Pass.

This section of the genus is, however, very distinct in habit from the type as represented by *A. hirsutus*, Korth., and its ally, and, if not generically separated, this group might be distinguished as a section under the name of *Oritrephes*, the description being amended.

This species, which was not in flower at the time of my visit, is abundant on the open woods of the Padang. It should be pointed out that the stems and branches are distinctly quadrangular.

* 51. *ANERINCLEISTUS FRUTICOSUS*, Ridl. *op. cit.* p. 309. Very common in the rocky streams of the Padang, varying in size from a few inches tall, with one or two slender stems, to a stout woody plant with a stem half an inch or an inch through and over a foot tall, with red-brown bark bearing a cushion-shaped mass of branches. It grows in cracks in the rocks, and must frequently be covered by the rushing torrents. The calyx is red, and the buds, tinted with pink, expand in the early morning to a large, white, pointed star, half an inch across. The stamens are all similar and fertile.

This plant is certainly very unlike any other species known to me, and in fruit at least resembles a *Sonerila*. Endemic.

52. *OXYSPORA HIRTA*, n. sp.

A tall shrub with few branches, base of stem bare, corky, white, 5 to 6 feet tall, leafy only at the top. Leaves lanceolate to ovate-lanceolate, herbaceous, rather stiff, apex acute, base peltate, cordate, 8 inches long, 3 inches wide, nerves 3, conspicuous, nervules horizontal, numerous, above glabrescent,

beneath hairy with small hairs, the nerves densely covered with longer black hairs, as are the margins of the leaf; petiole 3 inches wide, black, hairy. Panicle in fruit, terminal base with spreading branches, hairy, 8 inches long. Fruit pink, elongate urn-shaped, narrowed to the base, $\frac{1}{4}$ inch long, on a pedicel as long, glabrous.

Damp woods in the Gully and the first Padang stream In fruit only.

Allied to *O. rosea*, Ridl., of the Tahan River and Trengganu, but differing in the rounded cordate peltate leaf-base and its hairiness.

53. [PACHYCENTRIA SPECIOSA, n. sp.

Epiphytic shrub, strongly woody, with a stem over a foot tall, $\frac{1}{4}$ inch through, bark grey, branched above, branches knotted. Leaves fleshy coriaceous, ovate-lanceolate, narrowed to an obtuse tip, base shortly narrowed, nerves 3, not very conspicuous except the midrib beneath, 2-3 $\frac{3}{4}$ inches long, 1 inch across, petiole $\frac{3}{8}$ inch long. Flowers in umbelled red viscid cymes, terminal on the branches; peduncle $\frac{3}{4}$ inch long, cyme-peduncles $\frac{1}{2}$ inch, pedicels $\frac{1}{4}$ inch, each cyme of 3 flowers. Bracts minute, tooth-like. Calyx-tube dilate at base, over the ovary subglobose, above a tube ending in a shortly 4-lobed limb, constricted below, $\frac{1}{4}$ inch long, red, viscid. Petals 4, ovate, cuspidate, rose-pink, $\frac{1}{4}$ inch long. Stamens 8, unequal, 4 short, 4 rather longer, all similar in form; filaments linear, long, flat; anthers yellow, cylindric, acuminate-arcuate, base bifid with two short curved points, connective at the back of the base, prolonged into a short linear process.

Above Wray's Camp on a *Livistona Tahanensis*, Becc. This beautiful plant is distinct in possessing the largest and showiest flowers of any recorded species. The whole of the inflorescence is very viscid and gummy, as is the case in other species of this genus.]

54. SONERILA CÆSIA, Stapf. A large form in the Gully below the Padang.

Distribution. Perak and Telom in Pahang.

55. SONERILA TENUIFOLIA, Bl. *antea*, p. 46. In the Gully and damp spots along the first stream on the Padang beyond the waterfall.

Distribution. Mountains of the Peninsula, Java, and Borneo.

56. PHYLLAGATHIS HISPIDA, King. In the Gully and the Teku woods up to about 4,600 feet elevation. Common in the woods of the Tahan River and in Perak.

*57. MEDINILLA PAHANGENSIS, Ridl. *op. cit.* p. 310. Gunong Tahan at 5,000 feet (Robinson). Not seen again. Endemic.

58. M. HASSELTII, var. Epiphyte, stem white, with dark warts. Leaves elliptic-lanceolate, blunt, slightly narrowed at the base, fleshy, pale beneath, nerves 3, prominent on the

back, 4 inches long, $1\frac{1}{2}$ inch wide; petiole slender. Cymes axillary below the leaves, 2 inches long; peduncle 1 inch, branches and pedicels spreading, pedicels $\frac{1}{2}$ inch long. Fruit $\frac{1}{8}$ inch long, small, cupular, with four short sepals.

Padang woods.

This differs from typical *M. Hasseltii*, Bl., in its elliptic blunt leaves, and may be a distinct species, but I could get no flowers.

*59. *MEMECYLON MAINGAYI*, Hook. fil.; Ridley, *op. cit.* p. 310. I found this plant in fruit again as it was collected by Robinson on the previous expedition, and can confirm his statement that it is a climber. As no *Memecylon* is known to be scandent, and the plant looks otherwise different from any typical species of the genus, I am doubtful as to what it really is.

BEGONIACEÆ.

*60. *BEGONIA HERVEYANA*, King; Ridley, *op. cit.* p. 310. In the Gully. The petioles are cooked and eaten by Malays.
Distribution. Pahang and Perak. Common in the hills.

ARALIACEÆ.

61. *HEPTAPLEURUM GLOMERULATUM*, n. sp.

Erect treelet. Leaves digitate, petiole terete, 14 inches long, leaflets 8, petiolules 2-3 inches long, blade thinly coriaceous, elliptic-ovate, cuspidate, rounded, or narrowed slightly at the base, nerves impressed above, elevated beneath, 6 inches long by 3 inches wide, drying black, paler beneath. Panicles short, not fully developed, with several branches, scurfy. Flowers sessile, in small globose heads subtended by lanceolate-acuminate bracts, $\frac{1}{8}$ inch long, ciliate on the margins. Floral bracts similar, smaller and narrower. Calyx short and broad, turbinate. Petals pubescent, ovate, blunt, connate. Stamens 6, short, filaments very short, not as long as the anthers; anthers elliptic, blunt. Stigmas connate, forming a blunt cone.

Woods on the banks of the stream at the Ninth Camp. Several trees of this were seen, but only one bore young flowers.

The tree is allied to the little-known *H. Scortechinii*, but differs in the broader, shorter, thinner leaves and bracts flat, not convolute, lanceolate-cuspidate, and ciliate with white hairs.

62. *HEPTAPLEURUM ELEGANS*, n. sp.

A tall, rather slender-stemmed plant. Leaves digitate, with ten leaflets, leaflets elliptic, cuspidate, coriaceous, drying dark brown, polished above, glabrous, 4 inches long, $1\frac{1}{2}$ inch wide; nerves six pairs, indistinct; petiolule 1 inch long; petiole 10 inches long, rather slender, $\frac{1}{8}$ inch through when dry. Panicles numerous, about 5, strict, erect, 12 inches long, basal 3 inches nude, terete, above with distant umbels half an inch long; peduncles scurfy; flowers small, about 20 in an umbel.

Bracts very small, lanceolate, scurfy brown; pedicels $\frac{1}{10}$ inch long; ovary obconic; petals ovate-obtuse, connate, as long as the ovary; sepals reduced to minute points. Stamens very short; filaments as long as the elliptic-ovate, obtuse, deeply grooved anthers. Disc umbonate, rugose.

On the Padang in small woods. Endemic.

Most nearly allied to *H. Hullettii*, King, but a taller slenderer plant with smaller leaves.

63. *HEPTAPLEURUM CORIIFOLIUM*, *Ridl.* Common on the Padang. A fairly large erect shrub here, about 8 feet tall. On Gunong Berumbun in Perak, where the type was found, it was a dwarf shrub only a couple of feet tall.

GAMOPETALÆ.

CAPRIFOLIACEÆ.

64. *VIBURNUM LONGISTAMINEUM*, n. sp.

A shrub about 12 feet tall. Leaves opposite, elliptic-cuspidate, base cuneate, membranous, glabrous, with four pairs of nerves, slender above, fairly stout, elevate beneath, $3\frac{1}{2}$ – $4\frac{1}{2}$ inches long, 2 inches wide, petiole half an inch long, all glabrous except for a tuft of hairs in the nerve-axils. Corymb terminal on peduncle, 2 inches long; branches umbellate, $\frac{3}{4}$ inch long, secondary branches $\frac{1}{2}$ inch long, umbellate, all subglabrous with a few white hairs. Bracts very small, ovate. Flowers sessile, white; calyx oblong, with 5 very short lobes, ovate, margins ciliate. Corolla shortly campanulate, with 5 ovate spreading lobes, white; whole flower $\frac{1}{8}$ inch long and as wide. Stamens 5; filaments four times as long as the corolla, spirally twisted, $\frac{1}{4}$ inch long, white; anthers elliptic, obtuse, dorsifixed. Pistil short conic, truncate, ribbed; stigma small, conic.

Woods by the streams on the Padang at 5,600 feet elevation.

Allied to *V. sambucinum*, Bl., the common low-country species, but nearly glabrous, with a smaller corymb (2 inches across) and very long projecting stamens.

RUBIACEÆ.

65. *ARGOSTEMMA INVOLUCRATUM*, *Hemsley*. Common on banks of streams on the Padang.

Distribution. All the higher hills of the Peninsula.

*66. *ARGOSTEMMA MUSCICOLA*, *Ridl. op. cit.* p. 310. Common on banks of streams in the Padang, also at Wray's Camp. This plant, besides being a tufted erect herb, creeps with a slender stem and distant leaves. Endemic.

67. *ARGOSTEMMA ELONGATUM*, n. sp.

Stem succulent, creeping, 2 feet or less long, with slender roots from the nodes, which are 3 inches apart. Leaves very unequal, the larger ones thin, succulent, glabrous, ovate-acuminate, base rounded, pale beneath, with 10 to 12 pairs of

thin nerves, 3 inches long, 1 inch across; petiole $\frac{1}{2}$ inch long, the small leaf sessile, lanceolate-acuminate, $\frac{3}{8}$ inch long, $\frac{1}{8}$ inch wide. Stipules ovate, obtuse. Flowers about 4 on a peduncle, an inch long, with 4 stipuliform bracts about halfway up, glabrous below, pubescent above the bracts. Floral bracts linear, $\frac{1}{10}$ inch long. Pedicels $\frac{1}{4}$ inch long, pubescent. Calyx campanulate, hairy, $\frac{1}{8}$ inch long, the lobes lanceolate-acuminate, nearly as long as the tube. Corolla white, half an inch across; tube very short; lobes 5, lanceolate-acuminate, acute. Stamens as long as the petals, lanceolate-acuminate, beaked.

In thick woods on the bank of the Teku River at about 4,600 feet altitude.

This is most nearly allied to *A. Hookeri*, King, but the leaves are larger and more remote and the flowers are smaller.

*68. ARGOSTEMMA YAPPIL, King; Ridley, *op. cit.* p. 311. Common in shady wet spots up to 7,100 feet elevation on Gunong Tahan.

Distribution. Hills of the Malay Peninsula.

*69. HEDYOTIS PATENS, Ridl. *op. cit.* p. 311.

A very common plant from Wray's Camp, 3,300 feet elevation, to the top of Gunong Tahan, in open places among low bushes. The plant is very variable in size, tall with a widely spreading panicle in the denser thickets by Wray's Camp, short and more compact in leaf and panicle in the open dry Padang. I never saw it creeping, as described by Robinson. The petals are usually greenish white, occasionally purplish, and when open are curled back so as to expose the long projecting stamens. These are extended in a horizontal direction, the two lower ones slightly longer than the three upper ones. The anthers are purple. The flower opens in the morning very early, and the petals curl back. The stamens are projecting and the style is only $\frac{2}{3}$ of the length of the stamens. On the second day the stamens are withered and the style is now considerably longer than them and is projecting horizontally. In the ordinary species of the genus the short stamens hardly protrude their tips from the mouth of the tube and the petals are not recurved, and they do not appear to be visited by Hymenoptera. The structure of the flower of *Hedyotis patens* appears to be unique in the genus. The flowers, which are very inconspicuous, are visited and regularly pollinated by a species of *Bombus*. This insect spends the whole day, from shortly after sunrise to sunset, at these flowers, almost to the exclusion of any other flower, wherever the *Hedyotis* is abundant. I have, however, seen it at work on *Xyris grandis*, *Melastoma longisepala*, and *Baeckia*. It does not fly from one species to another, but confines its attentions to the *Hedyotis* or *Xyris* as long as there are any in the vicinity. In attacking the *Hedyotis*, it clings to the branches of the cyme and inserts its proboscis above the stamens, in such a way that the anthers brush the underside of the abdomen. It visits also flowers in which the stamens

have withered and the style has attained its full development, and strikes the abdomen beneath as the stamens previously did.

The humble bees, *Bombi*, are by no means common in the Malay Peninsula, and are practically, it appears, confined to this and a few other of our mountains and Tenasserim. The flower of the *Hedyotis* seems to be specially suited for pollination by the humble bee, and it may be suggested that its peculiar modification is a special adaptation for pollination by this insect.

70. [*HEDYOTIS RIVALIS*, n. sp.]

A branched weedy plant, about $2\frac{1}{2}$ to 3 feet tall. Stem $\frac{1}{10}$ inch through, half woody with a pithy centre, subquadrangular, with four narrow ribs running from the basal angles of the stipules. Leaves linear, acuminate, acute, base narrowed gradually to the petiole, glabrous, subcoriaceous, drying yellow-green, $3\frac{1}{2}$ inches long, $\frac{1}{8}$ inch wide or less, glabrous. Stipules broadly triangular, mucronate, scurfy, $\frac{1}{8}$ inch long. Inflorescence axillary and terminal of dichotomous cymes an inch long with a few flowers on short pedicels at the base; cyme-branches half an inch long with about 3 flowers in each cymule, lower cymes rebranched. Bracts small, linear, acute. Flowers small, white, $\frac{1}{8}$ inch long, very shortly pedicelled. Calyx small, campanulate, with 5 rather large ovate-lanceolate pubescent green lobes longer than the tube. Corolla-tube cylindric, glabrous, twice as long as the calyx-lobes, ribbed; lobes oblong-acute, pubescent, recurved, as long as the tube. Stamens 5, adnate to the mouth of the tube; anthers linear-oblong, just protruding at the tips. Style stout, stigmas elliptic, rather large. Disc pulvinate. Capsule ovoid, pale, $\frac{1}{10}$ inch long, crowned with the persistent calyx-lobes. Seeds minute, very irregular in form, acutely angled, black, reticulate.

On rocks at Jeram Ampai, Tembeling River.]

71. *UROPHYLLUM GLABRUM*, Wall. In the Teku woods, apparently not common. I did not see the plant here, but below Wray's Camp, 3,300 feet alt., I found a remarkable plant of the *Griffithianum* form which was a tall bush, like an elder bush, with a stem 4 inches through at the base, and strict erect branches, all covered with pale corky bark. The rest of the plant was quite indistinguishable from the ordinary slender shrub, which is little or not branched from the base and with smooth green or brownish thin bark.

The species is common all over the Peninsula and most of the Malay islands.

*72. *TIMONIUS MONTANUS*, Ridl. *op. cit.* p. 312. Common on the Padang. A slender treelet like *T. jambosella*, but with smaller leaves and slender flowers. The fruit is very distinct, being small, narrowly ovoid, narrowed to the apex, $\frac{1}{4}$ inch long, and black. Endemic.

73. *WEBERA STELLULATA*, var? A shrub only obtained in fruit may perhaps belong to this species. It was found in the Teku woods.

*74. *IXORA ROBINSONII*, n. sp.

Shrub, with dark brown bark. Leaves coriaceous, oblanceolate to ovate-lanceolate, acuminate, apex blunt, narrowed at the base, nerves slender, about ten pairs, midrib prominent beneath, grooved above, petiole winged to base, 4 to 7 inches long, 2 inches wide. Stipules connate, cylindric, truncate, mucronate, persistent. Cyme large, lax, with several branches, many-flowered, 3 inches long, 4 inches wide. Flowers red, on pedicels $\frac{1}{10}$ inch long; lobes ovate-subobtusate, shorter. Corolla $2\frac{1}{2}$ inches long; tube slender, 2 inches long; lobes 5, half an inch long, lanceolate-acute, acuminate, narrowed at the base, red. Style shortly protruded, grooved.

Pahang, Gunong Tahan (*Robinson*, 5304). It occurs from a little above Wray's Camp, 4,000 feet alt., to the Gully, about 5,500 feet alt. Accidentally omitted from the original publication of the Gunong Tahan collections. A very distinct species in its coriaceous leaves, and large flowers an inch across, with acute lobes narrowed at the base. Nearest perhaps to *I. stricta*, Roxb. A most beautiful, perhaps the most beautiful of the *Ixoras*; the flowers of a salmon-red in a fine spreading cyme.

75. *LASIANTHUS FLAVINERVIUS*, n. sp.

Shrub, stem, and young parts covered with appressed yellow hairs. Leaves elliptic, acuminate, base slightly narrowed, above glabrous, smooth, shining, beneath nerves and secondary nerves strongly elevated and covered with yellow hairs, nerves 7 pairs, nervules transverse, parallel, almost horizontal, reticulations distinct, 6 inches long, 2 inches wide; petiole yellow silky, $\frac{1}{4}$ inch long. Stipules very short, with two or three short teeth, all yellow hairy. Cymes shorter than the petioles, few-flowered. Flowers small, very shortly peduncled. Calyx $\frac{1}{8}$ inch long, campanulate, with 5 short teeth, hairy, tipped with blue. Corolla silky. Fruit $\frac{1}{4}$ inch long, campanulate, narrowed at the base, with five large, linear, lanceolate teeth, $\frac{1}{10}$ inch long, all hairy and blue. Pyrenes 4, backs rounded, front angled.

Gunong Tahan woods. Endemic.

Perhaps nearest to *L. pilosus*, Wight. The fruit is rather peculiar in its size, long sepals, and hairiness.

76. *LASIANTHUS ROBINSONII*, *Ridley*. In the Gully and Teku woods. In fruit. Also occurs on the ridges at Telom.

77. *LASIANTHUS MONTANUS*, *King & Gamble*. Woods round the Padang.

Distribution. Perak.

*78. *LASIANTHUS CHINENSIS*, *Benth.*; *Ridl. op. cit.* p. 312. In the Gully.

Distribution. Perak, China.

*79. *LASIANTHUS CORONATUS*, *King & Gamble*. Common in the Padang woods and at Wray's Camp. A low shrub.

Distribution. Perak.

80. *CEPHAELIS ALBIFLORA*, n. sp.

A tall branched shrub 6 feet or more high. Leaves membranous, thin and flaccid when dry, oblanceolate-acuminate, acute, narrowed a long way to the base, glabrous, 6 inches long, 2 inches wide; nerves 10 to 11 pairs, slender; petiole $1\frac{1}{2}$ inch long. Stipules lanceolate-ovate, mucronate. Peduncles terminate, green, flattened, 2 inches long; capitulum of 17 sessile flowers. Bracts several, ovate, rounded, truncate, green, $\frac{1}{4}$ to $\frac{1}{2}$ inch long, one below the head on the peduncle ovate-acute, cuspidate. Floral bracteoles linear-lanceolate, very small. Calyx-tube thick, with very short obscure lobes. Corolla-tube cylindric, half an inch long, with white hairs in the mouth; lobes ovate-acute, reflexed, the tips hairy. Stamens projecting above the mouth of the tube, oblong-obtuse, white. Style filiform, long. Stigma broad, transversely oblong, bilobed.

Common in woods by streams on the Padang.

A very distinct plant in its size and in the thin leaves and white flowers; allied to *C. cuneata*, Korth.

81. *PSYCHOTRIA SARMENTOSA*, Bl., var. On the Padang in woods, climbing. I take this to be a mountain form of *P. sarmentosa*, reduced in all parts and with more coriaceous leaves. I have somewhat similar forms, but less distinctly condensed, from Mount Ophir and Matang in Borneo.

The species is common all over the Malay Peninsula and islands.

82. *PSYCHOTRIA BRACHYBOTRYS*, Ridl.

Scandent; stem herbaceous, branched; internodes an inch long. Leaves subcoriaceous, lanceolate, base acuminate, apex long-cuspidate, 7-nerved, glabrous, 4 inches long (including the cusp half an inch long), 1 inch wide; petiole slender, $\frac{1}{4}$ – $\frac{1}{2}$ inch long. Stipules connate, broad, with a short point. Cymes terminal, elongate, $1\frac{1}{2}$ –4 inches long; peduncles 3 inches long, terminated by small dense cymes an inch long, secondary branches scabrid. Bracts ovate-acuminate, $\frac{1}{2}$ inch long. Flowers in the terminal umbels about 20; pedicels in flower, $\frac{1}{10}$ inch long, minutely pubescent. Calyx saucer-shaped, with 5 short teeth, pubescent. Corolla $\frac{1}{2}$ inch long; tube thick, short, pubescent; lobes 5, bluntly lanceolate, nearly as long as the tube, densely woolly within the tube to the base. Stamens barely protruding from the mouth of the tube; filaments free nearly to the base; anthers elliptic. Style longer, stigmatic; arms 2, recurved. Fruit globose, white, pulpy, $\frac{1}{4}$ inch long when dry, on a pedicel $\frac{1}{2}$ inch long. Pyrenes flattened on the inner face; back rounded, with five ribs.

Gunong Tahan in the Gully, climbing on bushes by means of its petioles.

Distribution. Gunong Berumbun near Telom.

Near *Ps. Kunstleri*, King & Gamble, but has long cuspidate leaves and five-ribbed seeds. The specimens from which

the plant was originally described were not fully developed, so I have given a fuller description of it.

83. *PSYCHOTRIA CONDENSEA*, King & Gamble. Small compact shrub, epiphytic, with close-set, coriaceous, lanceolate-acuminate leaves with slightly narrowed base, 1 inch long by half an inch wide, glabrous, shining above, with the nerves almost invisible; petiole $\frac{1}{10}$ inch long. Flowers in short dense cymes, shorter than the leaves, $\frac{3}{16}$ inch long. Calyx shallow, with 5 very short teeth, glabrous. Corolla thick, tubular, scurfy outside, the lobes oblong-obtuse, not half as long as the tube, inside white, woolly round the stamens, glabrous above and below. Stamens with short filaments, shorter than the oblong-obtuse, rather large anthers. Style long, slender, glabrous, bifid at the tip. Fruit nearly a quarter of an inch long, oblong, very obscurely ribbed.

On Gunong Tahan to the summit, 7,186 feet elevation.

Distribution. Perak and Gunong Berumbun near Telom.

A single flowering specimen also got on the Padang differs in the thinner leaves in remoter pairs and the flowers just twice as large. A very little-known plant, of which the flowers have never been adequately described.

CAMPANULACEÆ.

*84. *PENTAPHRAGMA GRANDIS*, Ridl. *op. cit.* p. 312. Abundant from Wray's Camp to the Padang in wet shady spots. Endemic. The petals are oblong and retuse, yellowish white; the tube turns purplish within before withering, as it does in *P. Ridleyi*, King.

VACCINIACEÆ.

85. *VACCINIUM SCORTECHINII*, King & Gamble. A shrub with rose-pink flowers. On the ridge by Bukit Bandera and on the top of Gunong Tahan, altitude 7,186 feet. It occurs also in Perak at high elevations. *Vaccinium buxifolium*, Hook. fil., of Kinabalu, is closely allied to this plant; but the leaves of *V. Scortechinii* are rounder and distinctly gland-dotted beneath, and the flowers are pubescent.

*86. *VACCINIUM TEYSMANNI*, Miq.; Ridl. *op. cit.* p. 313. A common shrub on the Padang, in fruit only.

Distribution. Perak and Java.

87. *VACCINIUM KUNSTLERI*, King & Gamble. A shrub in fruit, Gunong Tahan. Not epiphytic here.

Distribution. Perak.

*88. *VACCINIUM PUBICARPUM*, Ridl. *op. cit.* p. 313. A large branching shrub or treelet, very common on the stream-banks in the woods of the Padang. Also collected on K'luang Terbang by Barnes.

*89. *VACCINIUM LONGIBRACTEATUM*, Ridl. *op. cit.* p. 313; *antea*, p. 49. A large bush common on the ridges of the track and the Padang. The original specimens were only in fruit, but I got flowers on this occasion and also received a flowering specimen from Gunong Ulu Kali, Selangor.

The flowers are in axillary pairs, on curved pedicels $\frac{3}{8}$ inch long, covered with short white hairs, as are the calyx and corolla. The calyx-tube is short and broad, campanulate, about $\frac{1}{10}$ inch long; the lobes lanceolate, triangular, acute, all very hairy. The corolla rose-pink, is $\frac{3}{8}$ inch long, cylindric, $\frac{1}{4}$ inch through, with short, recurved, ovate, obtuse lobes, hairy within and without. Stamens 10, included shorter than the tube; filaments slightly dilated at the base, hairy; anthers oblong as long, terminated by two cylindric pale-coloured tubes, truncate with circular openings at the tip; the body of the anther is 4-grooved, pustulate, red; the connective is prolonged from the centre of the anther on the back into a projecting lanceolate flat process. Style long and stout, hairy for most of its length. The fruit is pink when ripe, and sweet, but hard and not worth eating.

The plant has only been obtained on these two mountains, and on Gunong Kerbau 5,000–5,500 feet.

ERICACEÆ.

*90. *PIERIS OVALIFOLIA*, *Don*; *Ridl. op. cit.* p. 313. A large spreading shrub or tree overhanging the streams. Flowers white. On the Padang.

Distribution. Himalayas, Burmah, Perak, Japan.

*91. *RHODODENDRON MALAYANUM*, *Jack*; *Ridl. op. cit.* p. 313. Very common as an epiphyte and also as a terrestrial erect shrub on the ridges above Wray's Camp and on the Padang.

Distribution. Malay Peninsula, and Sumatra.

*92. *RHODODENDRON ELEGANS*, *Ridl. op. cit.* p. 314. Epiphytic on trees in thick woods, below the Gully and also in the Padang woods; not rare, but seldom in flower. The capsule is $\frac{1}{4}$ inch long, the valves lanceolate acute, widest towards the tip and slightly narrowed towards the base, $\frac{1}{8}$ inch wide in the widest part.

This pretty species is most nearly allied to *R. cuneifolium*, Stapf, of Kinabalu.

*93. *RHODODENDRON WRAYI*, var. *MINOR* (*Rhododendron Wrayi*, *Ridley, op. cit.* p. 314). On the Padang and up to the top of Gunong Tahan. The plant is smaller than the typical form of *Wrayi* in every part, the leaves usually distinctly smaller, and the flowers (which, however, were quite withered at the time of our visit) appear to have been not more than half the size. A plant collected in fruit on Telom ridge in the Batang Padang district seems to be the same species.

Distribution. Perak and Selangor.

94. *RHODODENDRON JASMINIFLORUM*, *Hook. fil.* On the camp stream on the Padang and the ridge near Bukit Bandera, just coming into flower at the end of our visit. The form more resembles that of Mount Ophir, both in the shape of the leaves and absence of pink spots in the mouth of the tube. The mouth is, however, tinted with rose-colour.

*95. *RHODODENDRON LONGIFLORUM*, Lindl.; *Ridl. op. cit.* p. 314. At 5,000 to 6,000 feet, collected by Robinson. I did not see this here, but found it at Wray's Camp, at 3,300 feet alt.

Distribution. Perak, Borneo, and Sumatra.

96. *DIPLYCOSIA LATIFOLIA*, Bl. Ridge by the Gully, Gunong Tahan.

Distribution. Perak, Selangor, and Java.

97. *DIPLYCOSIA BREVIFLORA*, n. sp.

Epiphytic shrub with slender branches, the young parts red with long, appressed, red hairs. Leaves alternate, obovate-obtuse, coriaceous, margins thickened with obscure crenulations, in each of which is a red appressed hair, above rugose (when dry), beneath paler dotted with depressions each containing a hair, nerves 2 pairs, very indistinct, 1 inch long and as wide; petiole $\frac{1}{2}$ inch long, red, hairy. Flowers in axillary pairs. Peduncles stout, rufous, hairy, $\frac{1}{2}$ inch long. Bracts 2, ovate, densely rufous, hairy, appressed to the calyx. Calyx-lobes ovate-acuminate, coriaceous, dark green, margins and apex long, hairy, $\frac{1}{2}$ inch long. Corolla shorter, subglobose, glabrous; lobes 5, triangular, quite obtuse, fleshy. Stamens 10; filaments base broad, flat, thin, narrowed, linear. Anthers orange-coloured, minutely papillose, lanceolate-acuminate; base rounded, bilobed; apex with two flattened, smooth, light yellow processes. Pistil glabrous, conic.

Epiphytic on a tree on the ridge below the Gully. Flowers green. July 15.

98. *CLETHRA CANESCENS*, Reinw. A single specimen obtained on the Padang.

Distribution. Java, Borneo, Celebes, and Lombok. New to the Peninsula.

*99. *LEUCOPOGON MALAYANUS*, Jack; *Ridley, op. cit.* p. 314. A common shrub on the Padang.

Distribution. Tenasserim to Malay Peninsula, Borneo, and Banka.

MYRSINÆ.

100. *MYRSINE PERAKENSIS*, King & Gamble? A big shrub, with branches only leafy at the ends. Leaves oblong-obtuse, narrowed to the base or rounded, stiffly coriaceous, glabrous, polished above, midrib thick on the back of the leaf, nerves very numerous, fine, and indistinct, 4 to 5 inches long, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches wide. Flowers not seen, fruits in short racemes on persistent thick peduncles, below the leaves very numerous. Pedicels 4-angled, $\frac{1}{4}$ inch long. Sepals 5, ovate, eglandular. Drupe globose, $\frac{1}{2}$ inch long, about 5 fruits on a peduncle $\frac{1}{2}$ inch long, with small ovate bracts.

Common on the Padang. In dry open places the stems are thicker, the leaves shorter, rounded at the base, and more coriaceous.

I have seen no specimen of the type, but I suppose from the description this plant is what is intended by *M. perakensis*.

101. *EMBELIA MYRTILLUS*, Kurz. On tree over the stream at the Ninth Camp.

Distribution. Burmah, Mount Ophir, and Perak Hills.

102. *LABISIA PUMILA*, var. *LANCEOLATA*. A single specimen brought in by a Dyak from the banks of the Teku River.

Distribution. Common all over the Peninsula.

103. *ARDISIA PETRICOLA*, n. sp.

Shrub, branches slender, dark brown; young parts scurfy, ferruginous. Leaves elliptic-obtuse, slightly narrowed to each end, coriaceous; nerves numerous, primary nerves slender, horizontal, parallel, hardly distinguishable from the secondary nerves; leaf above smooth and nerves inconspicuous, beneath nerves visible and whole leaf densely dotted with minute glands, midrib elevated, red, scurfy, 3 inches long, $1\frac{1}{2}$ inch wide; petiole $\frac{1}{4}$ inch long, channelled and winged to the base, red, scurfy. Panicle terminal, dense, 2 inches long, rachis red, scurfy; branches 7 or 8, short, half an inch long, bearing cymes of 3 or 4 flowers. Bracts very small. Calyx 5-lobed; lobes Corolla pink, $\frac{1}{4}$ inch across, tube hardly any; lobes 5, lanceolate acuminate, with large red glands on the tips, lanceolate ovate, obtuse, with numerous red glands on the back Stamens a little shorter ovate, cordate, mucronate, eglandular; filaments short. Style subulate, $\frac{1}{4}$ inch long. Buds acute.

Gunong Tahan, not rare up to 7,186 feet elevation.

Near *A. chrysophyllifolia*, King & Gamble, but the panicles almost invariably terminal (I found one plant with axillary panicles as well), not pubescent; the buds acute and stamens not gland-dotted.

*104. *ARDISIA RETINERVIA*, Ridl. *op. cit.* p. 315. Shrub, fruits black. Endemic.

*105. *ARDISIA BINIFLORA*, Ridl. *op. cit.* p. 314; Common in the Padang woods and thickets. Flowers pink. Drupes red. Endemic.

*106. *ARDISIA ROSEA*, King & Gamble; Ridl. *op. cit.* p. 314; *antea*, p. 50. Common in thickets and open woods on the Padang. Flowers usually nearly white.

Distribution. Hills of Perak and Selangor.

107. *ARDISIA MONTANA*, King & Gamble. A small tree with pink flowers, woods below the Gully.

Distribution. Perak.

108. *ARDISIA LABISÆFOLIA*, King & Gamble. Small tree with the panicle much more lax and spreading than in the type, in woods on the Padang.

Distribution. Perak.

STYRACEÆ.

109. *SYMPLOCOS PYRIFLORA*, n. sp.

A medium-sized tree. Leaves coriaceous, drying greenish yellow, elliptic-ovate or lanceolate-acuminate, obtuse, margins

undulate, crenate at the apex, base shortly narrowed, 5 inches long, 2 inches wide; midrib elevate beneath; nerves 6 pairs, branched and anastomosing; petiole $\frac{1}{4}$ inch long. Inflorescence of terminal sessile panicles of racemes 2 inches long. Branches pubescent. Bracts caducous. Flowers large, half an inch across, white, fragrant, sessile. Ovary short, obconic. Sepals large, glabrous, ovate or oblong-ovate, obtuse, $\frac{1}{10}$ inch wide, white. Corolla of 4 oblong rounded lobes, shortly joined at the base. Stamens about fifty; filaments as long as the corolla, free to base. Style stout. Stigma capitate. Drupe elliptic, rounded at both ends, sessile, light brown when dry, and crowned by the persistent sepals, $\frac{3}{4}$ inch long, $\frac{3}{8}$ inch through; pericarp corky. Seed not ribbed.

A common tree on the Padang in open woods and on stream-banks.

Near *S. cerasifolia*, Wall., but the flowers are larger, the fruit smaller, and the seed not ribbed. A very handsome tree.

110. SYMPLOCOS (CORDYLOBLASTE) PULCHERRIMA, n. sp.

Symplocos Scortechinii, Ridley, *op. cit.* p. 315.

Small tree; branches dark red, glabrous. Leaves elliptic-lanceolate, obtuse, narrowed to the base, margins crenulate with few long crenulations, coriaceous, glabrous, midrib channelled above, elevate beneath, red, nerves 9 pairs inarching within the margin, main reticulations nearly as prominent, 4 inches long, $1\frac{3}{4}$ inch wide; petiole channelled above, flattened, $\frac{1}{4}$ inch long. Inflorescence axillary, of 1—4 flowers on a short $\frac{1}{4}$ inch peduncle, nodding, glabrous. Bracts and bracteoles linear, very small. Calyx campanulate, $\frac{1}{8}$ inch long, with short rounded-ovate lobes, glabrous except the pubescent tips. Corolla $\frac{3}{8}$ inch long, base tubular; lobes free for $\frac{1}{3}$ their length, oblong-rounded, nearly glabrous with a little silky hair in the centre outside; margins pubescent, white veined with red. Staminal tube silky pubescent within, adnate to the corolla at the base of the lobes; free part of the filaments slender, of various lengths, the tallest little shorter than the corolla-lobes, about 60. Anthers rounded, oblong, four-lobed. Ovary ovoid. Style as long as the corolla-tube, all hairy. Stigma capitate. Fruit oblong, slightly narrowed at the base; apex elevated above the calyx-rim, white, silky, $\frac{1}{2}$ inch long, $\frac{1}{4}$ inch through.

Stream-banks on the Padang and woods on the ridges at Observation Hill. In the previous paper I referred this beautiful shrub to *S. Scortechinii*, King & Gamble, which species I have not seen. It differs, however, from the description in the smaller flowers, stiffer leaves, less hairy corolla, and several other points.

OLEACEÆ.

*111. OLEA CAPITELLATA, *Ridl. op. cit.* p. 317. A shrub with dark green leaves and small yellowish-white flowers. Common on the Padang and the ridges from near Wray's Camp. Endemic.

EBENACEÆ.

112. [MABA ELEGANS, n. sp.]

A small slender tree about 10 feet tall, with drooping branches covered with rather long stiff hairs. Leaves alternate, elliptic-lanceolate, obtuse, narrowed at the base, above glabrous, smooth, beneath the midrib covered with long hairs, nerves invisible, $\frac{1}{2}$ inch long, $\frac{1}{8}$ inch wide, nearly sessile, with a very small petiole. Flowers solitary, sessile or nearly so, on the underside of the branches entirely silky hairy, $\frac{1}{4}$ inch long. Sepals 4, ovate-rounded; tube of corolla elongate bottle-shaped, narrowed upwards; lobes lanceolate-obtuse, 3, hairy outside, glabrous inside. Pistil club-shaped, hairy, shorter than the tube of the calyx. Styles short, thick, glabrous; stigmas subtriangular, toothed, white. Disc hairy. Staminodes filiform, 3, slender, shorter than the pistil. Male flowers not seen.

Kuala Teku woods behind the Camp.

Apparently allied to *M. Beccarii*, Hiern, of Borneo. Altogether the smallest Ebony-tree I know, not much more than a shrub, and with very small leaves and flowers.]

APOCYNACEÆ.

113. ALYXIA ANGUSTIFOLIA, n. sp.]

Usually a slender climber in woods, suberect on the open Padang. Stems dark brown. Leaves coriaceous, elliptic-lanceolate, blunt or subacute, glabrous, margin thickened, midrib on the back very thick, channelled above, nerves invisible on both surfaces, 1 to 2 inches long, $\frac{1}{4}$ inch wide, in pairs or whorls of 3; petiole $\frac{1}{8}$ inch long. Flowers in terminal or axillary cymes, half an inch long, about 12 in a cyme; peduncle and pedicels short, scurfy, pubescent, ribbed. Sepals linear or lanceolate-linear, $\frac{1}{16}$ inch long, pubescent. Corolla white, $\frac{1}{4}$ inch long, glabrous; tube slender, cylindric, dilated slightly just below the lobes; lobes short-ovate, obtuse; mouth of tube with a thickened ring inside, below white hairy. Stamens 5; filaments very short; anthers tapering upwards, lanceolate. Style not longer than the anthers, glabrous. Stigma clubbed. Ovary white, villous. Fruit black, elliptic-obovoid, $\frac{1}{4}$ inch long.

Very common on the Padang, and in the woods, one of the very few climbers there.

Allied to *A. pumila*, Hook fil., of Mount Ophir and other parts of the Peninsula, but with very narrow stiffly coriaceous leaves with invisible veins.

ASCLEPIADEÆ.

114. DISCHIDIA ALBIDA, Griff. On trees in the Padang. Flowers yellowish white with pink tips to the petals.

Distribution. Malay Peninsula, usually at high elevations.

115. DISCHIDIA COCCINEA, Griff.; Ridl. *op. cit.* p. 315. On trees on the Padang at 5,600 feet.

Distribution. Common on the Peninsula at high elevations,

116. *DISCHIDIA CORDIFOLIA*, King & Gamble. The leaves in this plant, as well as in another quite similar collected by W. D. Barnes in K'luang Terbang, are lanceolate and hardly cordate; but I think it is the same as the plant from the Taiping hills, which I take to be the species intended by the authors.

117. [*DISCHIDIA BENGALENSIS*, Colebr. Occurs on the ridges above Wray's Camp, alt. 3,300 feet. It ranges from India to the Malay Islands.]

GENTIANACEÆ.

*118. *GENTIANA MALAYANA*, Ridl. *op. cit.* p. 316. Common on stream-banks on the Padang, and in damp spots, also near Skeat's Camp. The flowers are a pure azure-blue; I once, however, found a pure white one on Gunong Ulu Riang. Endemic.

*119. *CANSCORA TRINERVIA*, Ridl. *op. cit.* p. 316. Common in damp shady places at Wray's Camp 3,000 feet altitude to the Padang woods 5,600 feet. The flowers are pure white, two of the petals are smaller than the others and so closely appressed that at first glance they look like a single one, giving the flower the appearance of a *Sonerila*. Endemic.

120. *CRAWFURDIA BLUMEI*, Don.; *antea*, p. 51. A pretty twiner with yellowish corolla and beautiful pulpy violet fruit. In woods on Observation Hill and the Padang.

Distribution. Java, previously collected by Wray in Pahang. Gunong Kerbau, Perak, 6,600 feet.

LOGANIACEÆ.

*121. *GAERTNERA RAMOSA*, Ridl. *op. cit.* p. 317. Common on the Padang in the woods at 5,000-6,000 feet altitude. Flowers white. Endemic.

*122. [*GAERTNERA LANCEOLATA*, n. sp. (*G. oblanceolata*, Ridl. *op. cit.* p. 317.)

Shrub with a brown woody stem $\frac{1}{2}$ inch through. Leaves elongate, lanceolate-acuminate equally to each end, coriaceous, 7 inches long, 1 inch wide; nerves 7 pairs, upcurved towards the margin, secondary nerves nearly as distinct, reticulations fine, distinct, whole leaf minutely punctate above, dotted beneath; petiole stout, half an inch long, winged to the base. Branch-leaves similar, nearly 2 inches long, $\frac{1}{2}$ inch wide. Stipules tubular, $\frac{1}{4}$ inch long, with 5 or 6 ribs and 5 or 6 setaceous points, usually entire, but often split nearly to the base. Cymes slender, base 3 inches long, with a peduncle half its length; branches few and short, the lowest a quarter of an inch long, two pairs, the rest one-flowered. Rachis minutely pubescent. Bracts, lower ones linear, setaceous, as long as the cymes, upper ones short-ovate, acuminate. Pedicels $\frac{1}{16}$ inch long. Calyx small, cup-shaped, margin entire or nearly so, teeth absent or minute, puberulous. Corolla $\frac{1}{8}$ inch long, white, glabrous, tube as long as the lobes, cylindric, lobes ovate,

oblong, obtuse. Fruit globular, smooth, black, small, supported by the enlarged saucer-like calyx.

Wray's Camp, in bushy spots (*Robinson & Wray*, 5,343; *Ridley*, 16,255) at 3,300 feet.

I have seen no type of *G. oblanceolata*, King & Gamble, but from description I take it that the plant intended is one of much stouter habit and large leaves, with short-panicked cymes shorter than the leaves, which occurs at Maxwell's Hill on the Taiping Range.

In the Tahan plant elongate branches are borne which carry narrow leaves very different from the stem-leaves, and on the ends of the branches are slender, reduced, compound cymes.

Allied to this plant is one from the Semangko Pass and one from Bukit Hitam in Selangor, which I will describe here.]

123. [GAERTNERA DIVERSIFOLIA, n. sp.]

Stem woody, stout, $\frac{1}{4}$ inch through, pale brown; stem-leaves thinly coriaceous, elliptic-ob lanceolate, acuminate, cuspidate, gradually narrowed to the base, glabrous, nerves conspicuous on both surfaces, 6 to 10 pairs, 11 inches long and 3 inches wide; petiole winged for part of its length, only an inch long, stout. Stipules tubular, half an inch long, with 5 long setaceous teeth. Side-branches 10 inches long, base for 3 or 4 inches bare (a single internode), then 1 to 2 pairs of leaves, distant, terminated by 1 or 2 rather lax-panicked cymes $1\frac{1}{2}$ inch long; leaves 2-3 inches long, $\frac{1}{4}$ - $\frac{1}{2}$ inch wide, lanceolate-acuminate. Stipules shorter and often split. Inflorescence glabrous, of short stout branches, each bearing three flowers, lower branches rebranched. Pedicels very short, $\frac{1}{16}$ inch. Calyx cup-shaped, with five short teeth. Corolla white, $\frac{1}{8}$ inch long; tube cylindric, thick; lobes oblong-obtuse, as long, glabrous outside. Fruit globose, smooth, one-seeded or double globose, 2-seeded, $\frac{1}{4}$ inch long; calyx but little enlarged; seed globular.

Selangor, Bukit Hitam (*Kelsall*, 1,995; *Ridley*, 7,429.)

This plant seems to me to be intermediate between the plant from Maxwell's Hill and the next species. The elongate axillary cymes with a long basal internode and the different-shaped leaves in this branch are absent in the former, while in the general structure of the stem-leaves and the flowers it resembles it.]

124. [GAERTNERA INTERMEDIA, n. sp.]

Stem woody, stout. Leaves oblanceolate, abruptly cuspidate, gradually narrowed from the middle to the base, subcoriaceous, nerves 10 pairs, conspicuous and prominent beneath, hardly so above, minutely dotted on both surfaces, 8 inches long, $2\frac{1}{2}$ inches wide; petiole $\frac{1}{4}$ inch long, winged nearly to the base. Stipules tubular with 4 or 5 setaceous points, often splitting in 2 halves. Floriferous branches nearly a foot long, with 4 pairs of leaves, internodes 3 inches long; leaves narrowly lanceolate-acuminate at both ends, smallest ones at the base, 1 inch long, $\frac{1}{8}$ inch wide, upper ones 2 inches

long by $\frac{1}{4}$ inch, upper portion of the branch puberulous. Bracts linear-acuminate at the base of the cyme, ovate-acuminate above. Branches in fruit stout, lowest one half an inch long. Calyx cup-shaped, obscurely 5-lobed; fruit globose.

Selangor, Hulu Semangko (Ridley, 12,080)

This plant distinctly connects *G. diversifolia* with *G. lanceolata*, especially in the texture of the leaves and their narrower form and shorter petiole.]

125. [GAERTNERA VIOLASCENS, n. sp

A shrublet with pale brown stems about $\frac{1}{2}$ inch through, the younger branches smooth, purplish. Leaves elongate-lanceolate, acuminate, acute at the tip, gradually narrowed and decurrent on the petiole below, herbaceous, glabrous, with 8 pairs of thin ascending nerves, drying olive-green above, paler beneath, 6 inches long, 1 inch across; petiole slender, 1 inch long. Stipules connate in a ring; lobes free, rounded-ovate, $\frac{1}{2}$ inch long. Peduncle terminal, 2-3 inches long, glabrous, bearing 3 or 4 branches, the lower ones spreading, $\frac{3}{4}$ inch long, upper ones on a longer peduncle. Bracts at the basal pair linear, obtuse, from a broad lanceolate base, half an inch long, green. Cymes 2 or 3 on the end of each branch, of few flowers, sessile. Bracteoles ovate. Calyx campanulate, short, with slight traces of teeth. Corolla dirty violet; tube, cylindric, half an inch long; lobes ovate, subacute, $\frac{1}{2}$ inch long, spreading or reflexed; tube within glabrous, except in the mouth at the point of attachment of the stamens, which is covered with dense white short hair. Stamens 5; filaments very short; anthers linear, obtuse. Style very slender, capillary. Ovary short, oblong, truncate. Fruit ellipsoid, sessile, half an inch long, of 2 pyrenes, each flat with a strong keel on the outer face.

By Wray's Camp, Tahan, at 3,300 feet altitude.

A very distinct plant, with unusually coloured flowers; all other species in the genus which I know have white flowers.]

LENTIBULARIACEÆ.

*126. UTRICULARIA NIGRICAULIS, *Ridl. op. cit.* p. 317.

This was first collected by Mr. Robinson, and described in the 'Journal of the Linnean Society, Botany,' vol. xxxviii. p. 317. I add the following notes about the plant:—

The leaves are narrow and linear, obtuse. The calyx has the upper lobe very obtuse, rounded at the tip and violet in colour, the lower lobe oblong and greenish, much smaller. Upper petals oblong-obtuse, whitish, violet at the base. Lip 3-lobed; lobes nearly equal, middle one a little smaller than the other two, violet with a darker spot at the base. The spur porrect, gibbous at the base, a little longer than the lip, violet. The stems are not always deep-coloured, sometimes being green.

This little plant was very abundant in damp spots on the peaty banks of the streams on the Padang and up the Teku

River; I also found it in a small damp spot on the ridge between Wray's Camp and Skeat's Camp.

127. *UTRICULARIA AUREA*, n. sp.

Leaves several in a tuft, linear, lorate, obtuse, $\frac{1}{8}$ inch long, narrow, bright green. Stem 1 inch to $1\frac{1}{2}$ inch tall, stouter than in the other species, purple, with 2 or 3 distant, bract-like, linear, oblong-obtuse leaves 1 mm. long. Flowers 1 or 2. half an inch long from the tip of the lip to the tip of the spur, Bracts lanceolate-ovate, purplish or yellow. Calyx: upper lobe broad, oblong-obtuse, lower one ovate, rather shorter, obtuse, all yellow. Petals ovate, oblong-obtuse, curved up at the tip, yellow, each with 2 fine brown streaks in the centre. Lip semiorbicular, broad, a quarter of an inch across; apex broad, truncate, with three obscure lobes, two rounded with a narrow tooth in the centre, two raised bars in the centre, and three short brown streaks at the base. Spur thick at the base, horn-shaped, curved, yellow, $\frac{3}{16}$ inch long.

On peaty banks of streams among moss and hepatics on the Padang. Just coming into flower at the time of our visit and not very abundant. This pretty little species has the biggest flowers of the three species here; the whole flower is of a rich orange-yellow with brown streaks on the petals and lip. I do not know any species here at all allied to it.

*128. *UTRICULARIA ANTHROPOPHORA*, n. sp.

Utricularia orbiculata, Ridl. op. cit. p. 318.

Leaves in rosettes, orbicular or obovate, $\frac{1}{10}$ inch across, bright green; petiole $\frac{1}{4}$ inch long. Branches with bladders, axillary, an inch or less long, as thick as the petioles. Bladders distant, elliptic-ovate, with two or three branched processes at the mouth. Stem slender, 2 inches long, pale. Upper sepal ovate, concave, much larger than the small lower one, apex broad, truncate; lower one ovate, very small. Petals linear, oblong-obtuse. Lip $\frac{1}{2}$ inch long, base oblong, apex four-lobed; side-lobes spreading, oblong-obtuse, central pair longer, oblong-obtuse, all violet with a yellow spot at the base. Spur longer, horn-shaped, curved, violet, slender.

Very abundant, and forming tufts over an inch across on rocks, with *Jungermannia* etc. on rocks in streams on the Padang, but only a few flowers met with. The form and size of the lip vary somewhat, but when fully developed it has much the form of that of *Aceras anthrophophora*. The leaves somewhat resemble those of *U. orbiculata*, but are more narrowed to the base. This must be the plant recorded as *U. orbiculata* in the previous paper.

GESNERACEÆ.

*129. *ÆSCHYNANTHUS RADICANS*, Jack? In fruit only. Wray's Camp and the Padang.

130. *ÆSCHYNANTHUS* sp. Also in fruit only. A larger species, near *Æ. longiflora*, Dec.

*131. *DIDYMOCARPUS ROBINSONII*, *Ridl. op. cit.* p. 318. Abundant in the Gully. The flowers are rather white streaked with violet and with a yellow blotch in the tube, than purplish streaked with white as originally described. Endemic.

132. *DIDYMOCARPUS* (*SALICINÆ*) *FILICIFOLIA*, n. sp.

Stem woody, 3—4 inches long. Leaves crowded at the top, oblong, linear, acuminate, base more or less narrowed, decurrent and obtuse on the petiole, margins bluntly closely serrate, above dark green, beneath whitish, glabrous, midrib and petiole transversely rugose, nerves about 17 pairs, $3\frac{1}{2}$ — $5\frac{1}{2}$ inches long, $\frac{1}{2}$ inch wide or little less; petiole $\frac{1}{8}$ inch long. Peduncles red, scurfy, slender, $1\frac{1}{2}$ —2 inches long, 2—4 flowered. Bracts linear, acuminate, $\frac{1}{8}$ inch long. Calyx-lobes narrow, linear acute, as long. Corolla short, campanulate, curved; lobes ovate, acute, $\frac{1}{4}$ inch long, white. Capsule linear, cylindric, acuminate, half an inch long.

Damp banks of the first Padang stream, local and nearly out of flower.

Closely allied to *D. salicina*, *Ridl.*, of the Tahan River, but differing in its leaf-base which is decurrent on the petiole above, ending in a rounded point, the short petiole, more parallel-sided leaves, and larger white flowers. The wrinkled midrib is very curious.

133. [*DIDYMOCARPUS ERICÆFLORA*, n. sp.]

Stem over a foot tall, $\frac{1}{8}$ inch through, woody, pale glabrous below, red-brown above when dry. Leaves elongate-lanceolate, apex long, acuminate, base narrowed gradually, somewhat inequilateral, glabrous, nerves 16—18 pairs, very inconspicuous, midrib elevated, transversely rugose below, channelled above, 6 inches long, 1 inch wide; petiole $\frac{1}{4}$ inch. The leaves are in slightly unequal-sized opposite pairs. Bracts 2, linear, glabrous. Peduncles $\frac{1}{8}$ inch long, adnate to the petioles. Pedicels erect, slender, $\frac{1}{8}$ inch long, scurfy, pubescent. Flowers in pairs, white. Sepals 5, linear, obtuse, blunt, green, $\frac{1}{8}$ inch long, very narrow, spreading. Corolla $\frac{1}{4}$ inch long, thick, tubular, slightly gibbous, below pubescent, white; lobes very short, $\frac{1}{2}$ inch long, ovate-obtuse, subequal, violet, glabrous within. Stamens 2, very short, less than half the length of the tube; filaments linear, straight; anthers rather large, cordate, obtuse. Style longer, fairly stout, pubescent; ovary angled, tapering slightly upwards. Stigma orbicular. Capsule 1 inch long, cylindric, acuminate at the tip, slightly upcurved, glabrous.

Wray's Camp, Tahan, not common.

The only plant at all allied to this is *D. lilacina*, *Ridl.*, which is common on the Tahan River. It is allied in the connature of the axillary peduncle of the inflorescence to the petiole, in the groove of which it seems to be imbedded. The short broad corolla-tube (somewhat of the shape of a heath flower), the short stamens (of which, however, the anthers are not connivent as in *Parabæa*, but are free and ovate,

not reniform—there are no rudiments of the second pair visible), make the plant very distinct, and these two species may well form a distinct section, if not a genus.]

*134. [DIDYMOCARPUS FLAVOBRUNNEA, var. MONTANA.

Stem woody, 10 inches tall or less, closely covered with short dense hairs. Leaves lanceolate-acuminate, base narrowed and decurrent on the petiole, margin dentate, herbaceous, sprinkled with hairs above, densely velvety hairy beneath, nerves 10 pairs, 6 inches long, 2 inches wide; petiole velvety, $\frac{1}{2}$ inch long. Scape 6 to 10 inches long, velvety, hairy. Flowers 6 or 7, crowded at the tip. Bracts lanceolate-acuminate, long, hairy. Pedicels $\frac{1}{8}$ inch long, hairy. Calyx-lobes lanceolate-acuminate, hairy. Corolla half an inch long; tube cylindric, dilated a little at the top, maroon-red; lobes rounded, $\frac{1}{8}$ inch long, yellow with broad maroon streaks. Capsule linear, acuminate, glabrous, an inch long.

Wray's Camp, at 3,300 feet.

This differs from typical *D. flavobrunnea*, Ridl., of the lower part of the Tahan, in its greater size, more softly woolly leaves, and in the different colouring of the corolla, which is barred with broad bands of red-brown instead of a few streaks.]

135. [DIDYMOCARPUS GRANDIFLORA, n. sp.

Stem elongate, a foot long, olive-green, woody, pubescent in the young part. Leaves opposite, in pairs three-quarters of an inch apart, oblanceolate, obovate or lanceolate, 1-2 inches long, obtuse or shortly cuspidate, base cuneate, glabrescent, with a few scattered pale hairs on the upper surface, beneath paler; nerves elevated, 3-4 pairs; petiole half an inch long, hairy. Pedicel $\frac{1}{4}$ inch long, purple, glandular, hairy, axillary from one of the lower leaves. Bracts lanceolate-acuminate. Sepals lanceolate-acuminate, both glandular, hairy, green. Corolla 2 inches long; tube glandular-pubescent, narrowed at the base, then dilate, trumpet-shaped; lobes broad, rounded, all purple; limb over an inch across, irregular, distinctly bilobed; median lobe of the lower lip larger than the side-lobes; a yellow, oblong, two-horned patch on the centre of the mouth of the tube, the rest violet-purple. Stamens 2, white; filaments long, slender, rising from the lower part of the tube to the mouth; anthers connivent. Style slender. Stigma circular.

In forest by the stream below Wray's Camp, Tahan. Rare. I could only find one flowering plant. In habit this certainly suggests a *Chirita* near *C. elata*, but the character of this genus, the bifid stigma, is wanting.]

136. PARABŒA LEUCOCODON, n. sp.

Stem rather stout, woody, simple or often branched, 8 inches to over a foot tall; bark corky white; young parts hairy. Leaves numerous, at the tips of the branches, oblanceolate, narrowed at the base, subacute at the tip, $5\frac{1}{2}$ inches long, 2 inches wide, thick, rather fleshy, dull dark green above,

paler beneath, and hairy glabrous above; nerves ascending, 7 pairs, hairy beneath; petiole short, stout. Flowers 1-4 on pedicels, shorter than the leaves, slender, red, hairy. Bracts lanceolate-acuminate, hairy, narrow. Sepals lanceolate-acuminate, sparsely hairy. Corolla campanulate, pubescent, pure white (very rarely tinted violet), an inch long; lobes ovate, regular, equal, obtuse. Stamens 2; anthers connivent, semi-ovate, white; filaments short, sigmoid. Style longer, curved. Stigma capitate. Capsule $\frac{3}{4}$ inch long, $\frac{1}{10}$ inch through, rather broadly linear and woody.

Very abundant in all the damp woods from the Gully upwards. In one plant on the first Padang stream I found the flowers of a violet colour, the other plants pure white. This fine species is not clearly allied to any other known to me. It is the largest species of the genus known to me, and remarkable for its beautiful white bells.

* 137. *PARABŒA RUBIGINOSA*, *Ridl. op. cit.* p. 319. On dry rock-faces, at Skeat's Camp, and by the Camp stream on the Padang; almost out of flower. Endemic.

* 138. *LOXOCARPUS INCANA*, *R. Br.; Ridl. op. cit.* p. 319. In the Gully and on rocks in the Teku at 4,600 feet elevation.

Distribution. Perak, Penang, and Selangor.

Flowers light violet with a darker central ring in the mouth. Stamens yellow at base, tips violet.

* 139. *LOXOCARPUS ANGUSTIFOLIA*, *Ridl. op. cit.* p. 319. On rocks by the Teku at the junction of the Camp stream. Flowers violet, larger than those of *L. semitosta*, *Ridl.* I have specimens of a plant apparently identical collected by Mr. Hullett in Lingga Island.

APETALÆ.

NEPENTHACEÆ.

140. *NEPENTHES SANGUINEA*, *Masters.* A few plants seen on the Padang.

Distribution. Mt. Ophir, Perak, and Selangor hills, Kluang Terbang.

141. *NEPENTHES MACFARLANEI*, *Hemsley, antea*, p. 54. This noble pitcher-plant, easily distinguished by the pubescent lid to the pitcher, is common in the damp mossy woods of the Padang. The pitchers are usually deeply embedded in the thick moss; they vary in colour from apple-green with red-brown slashes to entirely red with darker spots.

It occurs on many of our highest mountains.

* 142. *NEPENTHES GRACILLIMA*, *Ridl. op. cit.* p. 320. Abundant on the Padang. The leaves and stem are usually red or dark purple, and the stem when broken exudes a violet-purple stain. The pitchers vary in colour from green with vertical streaks of fuscous-black to entirely fuscous-black. I found also forms in which there was a distinct white ring round the mouth as in *N. albomarginata*, to which plant

Macfarlane, in the 'Monograph of *Nepenthes*,' says this is allied. Endemic.

* 143. *NEPENTHES SINGALANA*, var. *ALBA*.

Nepenthes Bongso, *Ridl. op. cit.* p. 320.

In the previous paper I referred this plant to *N. Bongso*, Korthals, but Macfarlane in the Monograph published in the 'Pflanzenreich' refers it to *N. Singalana*, Becc., of Singalang Mountain in Sumatra. Beccari figures a pitcher of this plant of very much greater size than any I have seen of the plant on the Tahan Padang, and though he does not appear to have recorded the colour of the pitchers at the time of gathering he gives them as dark purple. The plant is extremely common all over the Padang in the driest and rockiest spots, having a short thick stem deeply imbedded in cracks in the rocks, from which numerous long stems are emitted, which scramble over bushes and often form a very large mass. The pitchers are always very small, about the size of those of *N. gracilis*, and, on the whole, rather larger than those of *N. gracillima*. Usually they are of an ivory-white colour tinted with green at the base, and before opening of a yellow tint, and Mr. Kloss brought in one of a pure canary-yellow. The lid and the upper part of the pitcher within are frequently spotted with circular spots of pure rose-colour, and as the pitcher begins to wither it develops irregular blotches of the usual dull red of the other *Nepenthes*. This colouring is, I think, quite unique in the order of *Nepenthaceæ*. The pitchers usually contained little or no water, being quite dry inside. I found in the liquid, where there was any, the remains of ants and small diptera, and on one occasion a small Rutelid beetle, which was alive and uninjured, but most of the pitchers contained nothing.

BALANOPHORACEÆ.

144. *BALANOPHORA MULTIBRACHIATA*, *Fawc.* Common in the Padang woods up to 6,000 feet, deeply buried in the ground and just coming into flower. This species is common at high altitudes all over the Peninsula.

PIPERACEÆ.

145. *PIPER* sp., near *P. stylosum*, Miq. In the Gully in wet spots. This may be a variety only of *P. stylosum*, but it is certainly not typical, and I have no specimens quite like it in the herbarium, except a similar plant collected on Gunong Kerbau by Mohamed Aniff.

146. *PIPER GYMNOCLADUM*, *De Cand.*, var. This grew with the last species in the Gully. It differs from the plant which is a native of the Taiping hills, and is named by De Candolle *P. gymnocladum*, in its more coriaceous leaves, and may be a distinct species. The *Piperaceæ* of the materials for 'A Flora of the Malay Peninsula' are not yet published.*

*Issued since this paper left the author's hands. C. De Candolle, *Journ. Asiat. Soc. Bengal*, lxxv, pt iii, pp. 288-339 (1914).

LORANTHACEÆ.

* 147. LORANTHUS PULCHER, DC.; *Ridl. op. cit.* p. 321; *antea*, p. 54. Common on the trees in the Padang.

Distribution. Malay Peninsula.

* 148. LORANTHUS LOBBII, *Hook fil.*; *Ridl. op. cit.* p. 321. Common up to about 5,600 feet; the little flowers are rufous-orange.

Distribution. Common at high elevations.

* 149. ELYTRANTHE ROBINSONII, Gamble; *Kew Bull.*, 45 (1913). On trees in the Padang woods. Endemic.

150. VISCUM ORIENTALE, *Willd.*? On a tree by the stream on the Padang. I am doubtful about this species.

151. ARCEUTHOBIUM DACRYDII, n. sp.

A small greenish-yellow parasite of *Dacrydium Beccarii*, an inch tall, trichotomously branched; stems obscurely 4-angled, minutely papillose and rugulose; at each node a cup-shaped double bract with two small points. Flowers sessile, 2 to several protruding from this connate bract. Males shortly stalked; sepals 2, ovate, keeled; anther minute, sessile on the sepals. Female ovary elliptic-ovoid, with two ovate subacute sepals at the apex 1 mm. long. Drupe elliptic-ovate, shortly stipitate, crowned with two sepals.

Near the Camp on the Padang. This little parasite kills the branches gradually downwards, eventually apparently killing the bush altogether.

The genus is new to the Peninsula; species occur in the Palæarctic Regions of both Worlds, always parasitic on conifers, usually at least on pine-trees. This species is distinct in its host and the shortly stalked male flower, with two developed sepals and a trace of a third. These sepals are keeled and apparently do not expand.

SANTALACEÆ.

152. HENSLOWIA RIDLEYI, *Gamble, Kew Bulletin*, 201 (1912).

A slender climber, the stems about $\frac{1}{8}$ inch through, leaves elliptic-obtuse to ovate, apex rounded, base rather abruptly narrowed, coriaceous, with 3 parallel nerves running from the base; adult leaves greenish yellow to yellow, young ones red, one inch long by half an inch wide; petiole $\frac{1}{8}$ inch long. Male flowers in short axillary racemes, usually 2 in an axil; peduncle $\frac{1}{8}$ inch long; flowers yellow, 2 or 3 on a raceme, subumbellate at the top, shortly pedicelled. Perianth flat in bud; lobes 4, acute-triangular, connate for nearly half their length, base not cylindric; whole perianth $\frac{1}{10}$ inch across. Stamens 4, adnate to the perianth, lobes near the base; filaments short, flat, linear; anther subglobose, 4-lobed. Rudimentary stigma very small. Female flower solitary, on a very small peduncle, axillary, usually 2 in the axil of a leaf, $\frac{1}{8}$ inch long, red. Perianth-lobes 4 or 5, triangular-acute, with

an equal number of stamens as in the male. Fruit half an inch long, when ripe ellipsoid, narrowed at the base, and crowned at the top by the triangular perianth-lobes, with the stamens, at first red, eventually black. Seed indistinctly 5-ribbed.

Common on the Padang, climbing on bushes, also on Skeat's ridge. Also on Kluang Terbang (*Barnes*) and at the Sempana Mines, Selangor.

The absence of any tube to the male flowers and the rudimentary ovary are very distinctive.

Since writing the description of this Gamble has described it in the Kew Bulletin, and "Materials for a Flora of the Malay Peninsula," Journ. Roy. Asiat. Soc. Bengal, ii. 1912, p. 271, under the name of *H. Ridleyi*.

*153. *HENSLOWIA LOBBIANA*, A.DC. I did not see this on the Padang. Mr. Robinson collected, however, specimens which, I believe, belong to this species.

THYMELEACEÆ.

154. *WIKSTRÆMIA CANDOLLEANA*, *Meisn.*, var. With more ovate, cuspidate, coriaceous leaves and flowers on very short racemes. A somewhat similar, but less xerophytic, form occurs in Gunong Hijau of the Taiping hills. It may be the *W. androsæmifolia*, *Lesch.*, of Java.

It was an abundant shrub on the Padang, known to the Malays as "chandan," and its bast was invaluable for tying. Flowers yellowish green.

PROTEACEÆ.

155. *HELICIA SUFFRUTICOSA*, n. sp.

A shrub or dwarf treelet with pale bark. Leaves lanceolate-acuminate, slightly narrowed at the base and rounded, margins with a few short teeth, coriaceous, glabrous, drying light green, nerves 7 pairs, inconspicuous above, prominent beneath, slender, inarching within the margin, 7 inches long, 3 inches wide; petiole thick, $\frac{1}{4}$ to $\frac{1}{2}$ inch long, geniculate at the apex. Raceme from below the leaves, slender, 6 inches long. Flowers solitary or in pairs, on a short pedicel, $\frac{1}{8}$ inch long, white, about 50. Bracts lanceolate-acuminate, minute. Sepals lanceolate, $\frac{1}{8}$ inch long; base linear, narrow, 1 inch long; stamens 4, elliptic, connective prolonged into a short blunt point. Style 1 inch long. Bracts lanceolate-acute, $\frac{1}{10}$ inch long.

Gunong Tahan, Teku woods. In dense forest by the stream. The smallest species of *Helicia* I have seen. Plants under 2 feet tall seemed to be adult.

LAURINEÆ.

156. *CINNAMOMUM MOLLISSIMUM*, *Hook fil.* Teku woods. Gunong Tahan.

Distribution. Penang and Perak.

October, 1915.

*157. *DEHAASIA LANCIFOLIA*, Ridl. A common shrub or tree in the open woods and stream-banks of the Padang. Endemic.

158. *ACTINODAPHNE PRUINOSA*, Nees. This plant differs from *A. pruinosa* of the Penang hills in having the leaves rounded at the base.

A shrub on the Padang.

Distribution. Singapore, Penang, and Perak.

159. *ACTINODAPHNE* sp. A tree with grey bark; leaves shining above, glaucous beneath and glabrous, with seven pairs of nerves strongly elevate and red beneath, margin strongly thickened, transverse nerves horizontal, 11 inches long, 6 inches wide; petiole 1 inch; cluster of fruit half an inch across; peduncle thick, $\frac{1}{2}$ inch long, red, hairy. Drupe subglobose, $\frac{1}{4}$ inch long.

Dense woods on the Teku River (No. 16,125).

160. *LINDERA STRICTA*, n. sp.

A shrub with dark purplish bark. Leaves coriaceous, shining above, glaucescent beneath, lanceolate-acuminate, acute, base rounded, 3-4 inches long, 1 inch wide, 10-nerved, nerves fine, reticulations conspicuous on both surfaces; petiole thick, $\frac{1}{8}$ inch long, young leaves pubescent. Male flowers on axillary peduncles, $\frac{3}{8}$ inch long. Bud globose. Outer bracts orbicular, imbricate, coriaceous, 4, margins ciliate, inner ones thinner. Flowers in a head; pedicels silky, thick, $\frac{1}{10}$ inch long. Perianth-lobes 6 as long, oblong, linear, obtuse, silky. Stamens 9; filaments short, narrowed upwards. Anthers truncate, oblong, opening introrsely by valves, dehiscing below. Staminodes 6, adnate, in pairs to 3 of the stamens, shorter, apex yellow as of an abortive anther. Rudimentary pistil cylindric, short, obtuse. Female flowers too young. Fruit globose, $\frac{1}{8}$ inch through, black. Peduncle $\frac{1}{4}$ inch, somewhat thickened, dilated above into a short cup.

Gunong Tahan. Common on the Padang. An elegant bush with very erect leaves.

161. *LINDERA MONTANA*, n. sp.

Shrub. Leaves lanceolate-obtuse, shortly narrowed at base, coriaceous above, finely reticulate beneath, reticulations obscure, glaucous, 3-3 $\frac{1}{2}$ inches long, 1-1 $\frac{1}{2}$ inch wide; nerves fine, 4 pairs; petiole $\frac{1}{4}$ inch long, rather thick. Capitula globular, $\frac{1}{8}$ inch long, in pairs on extra axillary peduncles, $\frac{1}{4}$ inch long, on pedicels as long. Bracts 4, orbicular boat-shaped, ciliate at the edges. Flowers 5, on stout pedicels. Perianth-lobes short-oblong, quadrate, truncate, dotted. Stamens 7, fertile, as long; filament short, slender; anther wide-oblong, 2-celled; connective prolonged, rounded. Staminodes several, irregular. Fruit 2 or 3 together, pedicelled on a short peduncle. Pedicels stout, $\frac{1}{4}$ inch long, pubescent. Perianth cup-shaped, $\frac{1}{8}$ inch long and as wide, shallow, entire, margins pubescent. Drupe oblong-ovoid, $\frac{3}{8}$ inch long, black,

Ridges above Wray's Camp, in flower, in fruit on the Padang.

162. *LINDERA CINNAMOMEA*, n. sp.

A branching tree. Leaves coriaceous, ovate-acuminate, base narrowed, above dark green polished (brown when dry), beneath glaucous, sub-trinerved, the midrib and two ascending spreading nerves being connate at the base for 1 inch from the leaf-base, above is another pair, the reticulations very fine and conspicuous, 4 inches long, 2 inches wide; petiole $\frac{1}{2}$ to $\frac{3}{4}$ inch long. Inflorescence $\frac{1}{3}$ inch long, dense, sessile. Bracts ovate-obtuse, minute, hairy. Capitula very small, 3 or 4 together, outer bracts 4, imbricate, orbicular, hairy on the edges. Flowers 4, shortly pedicelled; pedicels silky, hairy. Perianth-lobes 4, oblong-ovate, hairy. Stamens 6; filament as long as the anther; anther extrorse. Fruit ellipsoid, acuminate, $\frac{1}{2}$ inch long, $\frac{1}{8}$ inch through; pedicel $\frac{1}{8}$ inch long, stout.

In woods on a stream near the base of Gunong Tahan and Gunong Ulu Riang (No. 16,124).

*163. *LINDERA* sp. A shrub, quite glabrous except the flowers, with coriaceous leaves, white beneath, three-nerved. This was referred by me to *L. casia*, Nees, but is certainly not that species as named by Gamble. It resembles *L. rufa*, Gamble, but is glabrous and has not acuminate leaves.

Common on the Padang.

164. *LITSEA* sp. A big tree with ovate leaves, glaucous beneath, and large globose bright red fruits like cherries.

Dense woods on the Teku at 4,600 feet.

The part of the flora dealing with the Laurineæ has recently been published, and many of the previous species also described by Mr. Gamble in the 'Kew Bulletin.' None of the above described species appear to be therein described, nor can I elsewhere find any description to suit them.

EUPHORBIACEÆ.

*165. *CHORIOPHYLLUM MONTANUM*, *Ridl. op. cit.* p. 322. A shrub with dull red capsules. Common on the Padang. I could find no flowers. Endemic.

MYRICACEÆ.

*166. *MYRICA FARQUHARIANA*, *Wall.*; *Ridl. op. cit.* p. 322. I only saw seedling plants of this in the Teku and other woods on the Padang. Mr. Robinson got complete specimens on the previous expedition.

Distribution. Indo-Malaya.

CUPULIFERÆ.

*167. *QUERCUS RASSA*, *Miq.*; *Ridl. op. cit.* p. 322. Collected by Mr. Robinson at 6,000 feet. I did not see any plants of it, but saw fallen fruits in the Teku woods.

Distribution. Malay Peninsula and islands.

MONOCOTYLEDONS.

ORCHIDACEÆ.

*168. *OBERONIA CONDENSATA*, *Ridl. op. cit.* p. 322. Epiphytic on trees by streams on the Padang. The stem is remarkable, being long and bare of leaves below and clinging to the bark by numerous roots. The flowers are yellow. Endemic.

*169. *PLATYCLINIS GRACILIS*, *Hook. fil. Ridl. op. cit.* p. 323. In woods on the Padang. Epiphytic, very fragrant.

Distribution. Perak and Borneo.

170. *PLATYCLINIS LINEARIFOLIA*, *Ridl.* Very common all over the rocks in all parts of the Padang exposed to full sun. The bright orange pseudobulbs and bright yellow flowers make it quite attractive. This was accidentally named *P. Kingii* in the previous paper.

Distribution. Mt. Ophir, and Batang Padang and Gunong Bubu in Perak.

*171. *DENDROBIUM LONGIPES*, *Hook. fil.; Ridl. op. cit.* p. 323. On the top of Gunong Tahan and Ulu Riang.

Distribution. Ulu Batang Padang, Gunong Semangkok and Gunong Kerbau, 6000—6,600 feet.

172. *DENDROBIUM MACROPODUM*, *Hook. fil.* On trees in the woods by the Camp stream.

Distribution. K'luang Terbang and the Larut Hills.

173. *DENDROBIUM GEMINATUM*, *Hook. fil.* Rather scarce on the Padang.

Distribution. Perak and Kedah at 4,000 to 5,000 feet altitude, also Java.

*174. *DENDROBIUM KELSALLI*, *Ridl. op. cit.* p. 323. On trees on the Padang. I did not see flowers of this plant, which was scarce, and so am not quite sure as to the identification.

*175. *DENDROBIUM* sp., near *D. GRACILE*, *Lindl.* Collected by Robinson on the previous occasion; I could not find it again.

*176. *DENDROBIUM UNIFLORUM*, *Griff. op. cit.* p. 323. Collected by Robinson at 5,000 to 6,000 feet altitude. On the Padang.

Distribution. Mt. Ophir and the Larut Hills.

*177. *DENDROBIUM RUPICOLUM*, n. sp.

Dendrobium bifarium, *Ridley, op. cit.* p. 324.

Stems six inches to a foot tall, erect, $\frac{1}{8}$ inch through, slightly undulate, the internodes $\frac{1}{2}$ inch long. Leaves $\frac{1}{2}$ to nearly $\frac{1}{2}$ inch long, oblong-obtuse, obliquely bifid at the tip and slightly dilated at the base, rather fleshy and bright green. Flowers solitary, $\frac{1}{4}$ inch across; ovary and pedicel very short. Sepals oblong-lanceolate, pale ochreous-brown. Mentum very short and blunt. Petals smaller than the sepals, and narrower, 3 nerved. Lip white or light yellow with a darker

central mealy blotch in the centre; claw linear, oblong; limb abruptly suborbicular, deeply retuse. Column short, with short tooth-like stelia.

Common on rocks and trees on the Padang. I have the same plant from Bukit Hitam in Selangor collected by Kelsall, and from Kluang Terbang in Pahang (with leaves a little longer and thinner) by Barnes. This might be but an alpine form of *D. bifarium*, to which I previously referred it; but the leaves are only half as big as in that species, as are the very small flowers, and the colouring is different.

178. *DENDROBIUM SINUATUM*, var. An elongate form, bigger than usual. On the Padang, not common. A similar plant was obtained in Kluang Terbang by Barnes. It is a foot long, with leaves 1 inch long and $\frac{1}{4}$ inch wide.

*179. *DENDROBIUM CORNUTUM*, *Hook. fil.; Ridl. op. cit.* p. 324. This beautiful plant with its bright pink flowers is abundant on mossy trees from below the Gully to the Padang. It seems to prefer the cold, damp, and dark woods, draped in moss.

Distribution. Perak.

*180. *DENDROBIUM SUBFLAVIDUM*, *Ridl. op. cit.* p. 324. Common on the trees from Wray's Camp to the Padang, but less abundant above 5,000 feet. Endemic.

181. *DENDROBIUM HYMENOPTERUM*, *Hook. fil.* Common on the stems of trees in the woods by the streams on the Padang and by the Teku.

Distribution. Kluang Terbang, Perak Hills, Kedah Peak, and Lankawi.

*182. *BULBOPHYLLUM GALBINUM*, *Ridl. op. cit.* p. 324. Common in the woods of the Teku and Padang to 5,000 feet altitude.

Distribution. Mountains of Perak and Selangor.

183. *BULBOPHYLLUM MICROGLOSSUM*, *Ridl. op. cit.* p. 325. Common in the woods from below the Gully to the Padang. Endemic.

184. *BULBOPHYLLUM TITANIA*, *Ridl. op. cit.* p. 325. On trees on the Padang. Endemic.

185. *BULBOPHYLLUM (MONANTHA-PARVA) DRYAS*, n. sp.

Rhizome very long and slender; no pseudobulbs. Leaves half an inch apart, ovate, fleshy, rugose, reddish in colour, covered with short black hairs, $\frac{1}{4}$ inch long, $\frac{3}{16}$ inch wide. Peduncle slender, filiform, an inch long, with a single appressed sheathing-leaf below. Bract amplexicaul, cup-shaped. Pedicel $\frac{1}{8}$ inch long. Flower solitary. Sepals elliptic-ovate, obtuse, $\frac{1}{4}$ inch long, primrose-yellow. Petals similar, but only half as long, paler. Lip oblong-ovate, obtuse, rather broad, as long as the petals, flattened, dull red with paler edges, and two low keels on the centre. Column whitish broad with broad, rounded, short stelia.

A single plant was brought in by one of the Dyaks from the Teku woods. It is a very distinct species of the section in its distant leaves with no pseudobulbs (looking like those of a *Dischidia*) and large flower.

186. *BULBOPHYLLUM* (*MONANTHA-PARVA*) PAN, n. sp.

Rhizome short, corky, white; pseudobulbs conic, rugose, purplish, $\frac{1}{2}$ an inch long. Leaf $1\frac{1}{4}$ to 2 inches long, $\frac{1}{4}$ inch wide, oblanceolate and acute; base narrowed to the petiole. Peduncle filiform, 3 inches long, with one sheathing-leaf, red. Flower solitary. Sepals over half an inch long, oblong-obtuse, red, striped with darker colour. Petals a quarter of the length of the sepals, oblong, the margins denticulate, whitish, tipped with black. Lip broad, short, flat, fleshy, blunt, tongue-shaped, grooved down the centre, base greenish, the larger part deep purple, nearly black. Column whitish, stout, with rather long curved slender stielidia.

Not rare on trees in dense woods on the Camp stream, Padang.

Perhaps nearest to *B. tenerum*, Ridl., but not hairy.

187. *BULBOPHYLLUM* *CAPITATUM*, Lindl. Common on trees on the Padang. Flowers light yellow or orange. Petals broader and larger than usual, oblong, rounded at the tip.

Distribution. Malay Peninsula and islands.

188. *BULBOPHYLLUM* *MUSCIFERUM*, n. sp.

Rhizome short, 2 inches long, with many roots; pseudobulbs oblong-conic, half an inch long, approximate or shortly separate. Leaf coriaceous, oblanceolate to linear-lanceolate, obtuse or subacute, 2 to 5 inches long, $\frac{1}{4}$ to $\frac{1}{2}$ inch wide, narrowed into a petiole from $\frac{1}{4}$ to 1 inch long. Scapes slender, 12 inches long, with two lanceolate, cuspidate, convolute sheaths; raceme deflexed, an inch long, dense with numerous closely appressed flowers. Bracts triangular, lanceolate-acuminate below, ovate-acuminate above, longer than the very short ovary. Flowers $\frac{1}{8}$ inch long. Upper sepal lanceolate-cuspidate, purple with darker stripes and minute spots, hairy. Lower sepals deflexed, as large, slightly oblique, the internal edge whitish, outer red-purple. Petals $\frac{1}{4}$ of the length of the upper sepal, lanceolate, fleshy-white tipped with a tuft of black hairs, and the edge denticulate, ciliate. Lip fleshy, cordate, lanceolate, base deeply emarginate, with a central groove on the surface, yellow; claw reflexed on the underside, purple. Column very short and broad with a moderately long purple foot. Stelidia short, oblong, bifid. Anther-cap flat, ovate.

Gunong Tahan on trees, in forests up to 7,000 feet.

This species is allied to *B. alcicorne*, Par., from which it differs in its denser spike, remarkable petals, and the shape of the lip. The extraordinary little flowers resemble a number of small flies perched on a stalk.

189. *BULBOPHYLLUM (CIRRHOPE TALUM) SKEATIANUM*, n. sp.

Pseudobulbs several together in a small clump, obpyriform, rugose transversely, 1 inch long, purple. Leaf linear, lanceolate, obtuse, narrowed to the base, coriaceous, 1 to 2 inches long, $\frac{1}{4}$ to $\frac{3}{8}$ inch wide. Peduncle 5 inches long or less, slender, purple. Bracts linear, acuminate, very small. Flowers 9 to 12 in a half whorl; pedicels 1 inch long. Upper sepal ovate-obtuse, dark purplish red with red streaks; lower sepals bright red to orange-red, half an inch long, linear, acuminate, connate towards the apex. Petals ovate-obtuse, deep red-purple, quite glabrous, as long as the upper sepal. Lip bright orange, tongue-shaped.

This charming little species is distinct in its broad sepals and petals all blunt, and the latter without the hairs usually found in *Cirrhopetala*.

On bare branches of trees on exposed rocky spots at Skeat's Camp, and also on the Padang on trees by the stream and in open woods on the side of the Teku. I am pleased to associate it with the name of W. W. Skeat, who first ascended the ridge as far as the spot named Skeat's Camp, where I first found this pretty plant.

190. *DENDROCHILUM ANGUSTIFOLIUM*, *Ridl.* On the summit of Gunong Tahan.

Distribution. Selangor Mountains, Bukit Hitam, and Kluang Terbang.

*191. *ERIA NUTANS*, *Lindl.*; *Ridl. op. cit.* p. 326. Gunong Tahan, 6,000 feet (*Robinson*), also found by me at Wray's Camp.

Distribution. Whole Peninsula, common in the low country.

*192. *ERIA CARUNCULATA*, *Ridl. op. cit.* p. 326. Gunong Tahan, 5,000 to 6,000 feet (*Robinson*). Not seen on this occasion. Endemic.

*193. *ERIA LONGIFOLIA*, *Hook. fil.*; *Ridl. op. cit.* p. 326. Gunong Tahan, 5,000 to 6,000 feet (*Robinson*). Not seen on this occasion.

Distribution. Hills of the Malay Peninsula.

194. *ERIA TAHANENSIS*, n. sp.

Stems erect, a foot tall, $\frac{1}{4}$ inch through, leafy, somewhat dilate at the base. Leaves coriaceous, linear, acuminate, 4 inches long, $\frac{1}{4}$ inch wide; sheaths 1 inch long, slightly flattened. Scapes terminal, 2-3, slender, many-flowered, laxly racemose, 8 inches long; rhachis white, woolly. Bracts lanceolate-acuminate, caudate, persistent, $\frac{1}{10}$ inch long. Ovary and pedicel slender, woolly, $\frac{1}{4}$ inch long. Perianth 1 inch long. Upper sepal ovate-lanceolate, woolly outside; lower sepals much broader, triangular-ovate, woolly outside. Mentum short, broad, half as long as the sepal. Petals oblong, thin, glabrous, obtuse, as broad as the upper sepal. Lip three-lobed; side-lobes from the base long, oblong, obtuse, thin; disc

narrow, fleshy; mid-lobe transversely oblong at the base of the lip; one erect rounded callus, with a smaller similarly shaped one on each side, between these a nerve elevated runs along each of the side-lobes; the narrow linear fleshy disc runs to the end of the middle, ending in an irregular, thick, fleshy, oblong rounded callus. Column, free part short, broad, with rounded stelidia.

Gunong Tahan, on trees in woods, 5,600 to 6,000 feet altitude. Endemic.

Allied to *E. bidens*, Ridl., and *E. iridifolia*, Hook. fil., but with a very different lip.

195. *ERIA* *EARINE*, n. sp.

Stems terete, 2 inches tall, fleshy, covered with papery sheaths; leaves at the lip only, 3-4, oblong, linear, fleshy, 2 inches long, $\frac{1}{4}$ inch wide, acute, light green. Racemes 1-2, erect, slender from the upper axils, 5 inches long, base nude, woolly, pubescent, red, with a few very small ovate bracts. Flowers very numerous, small, white. Bracts ovate, truncate or obtuse, persistent, red, woolly, $\frac{1}{10}$ inch long. Ovary and pedicel longer, cylindric, woolly, red. Sepals, upper one ovate-oblong, laterals bluntly triangular; mentum nearly as long as the ovary, all pubescent, white. Petals linear, oblong, nearly as long as the upper sepal. Lip shorter than the sepals, spathulate, apex rounded-triangular; two short, linear oblong, erect lobes at the base. Column broad, as long as its foot, purple with a very large, triangular, ovate stigma. Anther-cap broad. Rostellum short, but distinct. Capsule $\frac{1}{10}$ inch long, oblong.

On a tree on the Padang, rare.

Perhaps nearest to *E. Rimanni*, Rehb. fil., but remarkable for its very small white flowers in a strict spike. A very pretty little plant.

*196. *ERIA* *FEROX*, Bl.; Ridl. op. cit. p. 326. Common on the Padang.

Distribution. Mountains of the Peninsula, Java, and Borneo.

197. *ERIA* *POCULATA*, Ridl. On trees on the Padang. Common.

Distribution. Mt. Ophir, Larut Hills, and Kedah Peak.

198. *ERIA* *MONTICOLA*, Hook. fil. On trees on the Padang.

Distribution. Mt. Ophir, Pulau Aur, Selangor, and Perak Hills.

199. *ERIA* *TERETIFOLIA*, Griff.; Ridl. op. cit. p. 326. On trees by the Camp, 5,600 feet elevation.

Distribution. Mountains of the Peninsula and Borneo.

*200. *ERIA* *SCORTECHINII*, Hook. fil.; Ridl. op. cit. p. 327; antea, p. 55. On the Padang. Common.

Distribution. Mountains of the Peninsula.

*201. *ERIA* *CRASSIPES*, Ridl. op. cit. p. 327. On low bushes or terrestrial, Padang. Common. Endemic.

202. *ERIA LORIFOLIA*, *Ridl.* Not common, on trees on the Padang.

Distribution. Kedah Peak.

Flowers yellowish white; petals purple at the base; lip obscurely three-lobed at the tip, with a large rounded central lobe.

203. *TYLOSTYLIS PULCHELLA*, *Bl.* On bare rocks on the Padang. Scarce. The whole plant yellow.

Common all over the Peninsula and Java.

204. *PHREATIA CRASSIFOLIA*, *Ridl.* Very common on trees in the woods everywhere.

Distribution. Mountains of the Peninsula.

*205. *PHREATIA LISTROPHORA*, *Ridl. op. cit.* p. 327. Woods of the Padang, on the highest parts of Gunong Ulu Riang and Gunong Tahan.

Distribution. Perak hills and Lankawi.

206. *CERATOSTYLIS GRACILIS*, *Bl.; Ridl. op. cit.* p. 327. On bare rocks on the Padang, an erect tufted form with fleshy thick yellow stems and leaf; in the damp dark woods of the Teku River, long, slender, pendulous, and green stems.

Distribution. Whole Peninsula and Java.

*207. *TAINIA SPECIOSA*, *Bl. Ridl. op. cit.* p. 328. Common at Wray's Camp, rarer in the Padang woods.

Distribution. Mountains of the Peninsula and Java.

*208. *TAINIA VEGETISSIMA*, *Ridl. op. cit.* p. 328. From Wray's Camp to the Padang woods. Endemic.

*209. *SPATHOGLOTTIS AUREA*, *Lindl. & Ridl. op. cit.* p. 328. Open places in the Padang and also in the thinner woods.

Distribution. All mountains of the Peninsula and Borneo.

*210. *ARUNDINA SPECIOSA*, *Bl.; Ridl. op. cit.* p. 328 *antea*, p. 56. Rather scarce on the Padang and local; a fine dark-coloured form. Abundant on the gravel banks in the Tahan River.

Distribution. India, the Malay Peninsula, and Java.

211. *CALANTHE VERATRIFOLIA*, *Br.?* A single plant in fruit, found in the Teku woods at 4,600 feet altitude, may belong to this species.

212. *DILOCHIA CANTLEYI*, *Ridl.*

Very abundant and conspicuous all over the Padang, and also in the thicker forest. The form on the open rocks is usually about 2 feet high; the stems terete, purple; the leaves rather close-set, ovate-acuminate, suberect, coriaceous, green edged with purple, $1\frac{1}{2}$ inches long, 1 inch wide; in the forests it is taller, as much as 8 feet high; the leaves longer, rather more distant, and thinner in texture. The uppermost leaves are bractlike, ovate, cymbiform, pink, purple, or white. The racemes from 3 to 9, often branched and 3 inches or more long. The floral bracts boat-shaped, white, reddish or pink; pedicels purple. The petals and sepals creamy-white. The

lip oblong, half an inch long, with short rounded lobes, apex truncate, five elevated veins on the centre, dull purplish pink with a cream edge or darker purple with a yellow edge. Column yellowish striped with pink. The buds pink. The fruit globose to ovoid, pendulous, green, with a broad purple bar over each fertile segment and a narrower one between each; it is as big as a small gooseberry.

The plant is always terrestrial. It does not appear to have been met with outside the Malay Peninsula, where it occurs on Gunong Bubu, Gunong Inas, and Gunong Ulu Kali.

I am quite unable to guess why Reichenbach put this very distinct and peculiar genus under *Arundina*, from which it differs in habit, foliage, inflorescence, form of the lip, and most notably, in its three anthers and peculiar dehiscence of the fruit.

*213. *CÆLOGYNE DAYANA*, var. *MASSANGEANA*.

Cælogyne cymbidioides, Ridl. op. cit. p. 329.

Very abundant on the trees overhanging the streams of the Padang and the Teku River, and also in the Gully. The plant described by me as *C. cymbidioides* (Journ. Linn. Soc., Bot. xxxviii. p. 329) is a rather odd form, which was terrestrial, but is obviously an abnormal condition. The plants here were very fine, the pendent sprays of flowers reaching four feet in length.

214. *CÆLOGYNE LONGIBRACTEATA*, Hook. *fil.* A single specimen, identical with the plant of the Sempang Mines, was brought in by the men from the ridge between Wray's Camp and the Padang.

215. *CÆLOGYNE* (§ *SPECIOSÆ*) *XANTHOGLOSSA*, n. sp.

Rhizome stout, woody; pseudobulbs conic, four-angled, $1\frac{1}{2}$ inches long. Leaves solitary, oblanceolate-acuminate, long-petioled, 5-nerved, 7 inches long, nearly 2 inches wide; petiole 2 inches long. Raceme 2 inches, 1-2-flowered; peduncle stout, $1\frac{1}{2}$ inch long. Bract lanceolate-acuminate, $1\frac{1}{4}$ inch long. Pedicel very short; ovary 6-winged, short. Sepals lanceolate-acute, keeled, 2 inches long, pinkish, whiter at the base. Petals very narrow, linear acute, nearly as long. Lip 3-lobed; side-lobe oblong, 1 inch long; mid-lobe lanceolate, edges crisped, acute; keels from the base, 3, low, edge crisped, median one lowest, not hairy, canary-yellow; keels orange; centre of mid-lobe orange, margins pinkish. Column very stout, white; margin of clinandrium rounded; wings large, rounded. Anther large, half an inch long, ovate-obtuse, pale yellow. Pollinia pyriform, large, yellow. Rostellum large, ovate, entire. Stigma deep and wide with a distinct lip.

Woods on the Padang. A single plant brought in by the Dyaks.

Perhaps most closely allied to *C. Rumphii*, Lindl., very distinct in its yellow lip, with 3 low keels, the central one of which runs to the tip, the others half down the lip.

216. *CÆLOGYNE XYREKES*, n. sp.

Pseudobulbs crowded on a stout rhizome, oblong, 4-angled, 2 inches long, top truncate. Leaves obovate-oblongate to lanceolate, apex subacute, base narrowed for a long way, nerves 5, distinct, 9 inches long by 3 inches wide. Raceme 3 inches long, from the axil of the young leaf, 2-3-flowered. Bract lanceolate, 2 inches long; ovary and pedicel half an inch long. Upper sepal keeled, 2 inches long, $\frac{1}{2}$ inch wide, lanceolate, pinkish. Petals narrow, linear, $1\frac{1}{2}$ inch wide. Lip a little shorter than the sepal, distinctly three-lobed; lateral lobes rounded; mid-lobe half an inch long, oblong, rounded at the tip, rather narrowed; keels two, low, not hairy, deep brown; base of mid-lobe sepia-brown, edged with flesh-colour; side-lobes dark brown spotted with white. Column long; clinandrium longer than the anther, ovate, yellow. Rostellum lanceolate.

Teku woods below the Padang.

Allied to *C. speciosa*, Lindl., but with no hairs on the lip, the edges entire and mid-lobe smaller.

*217. *CÆLOGYNE CARNEA*, Hook. fil.; Ridl. op. cit. p. 329, *antea*, p. 58. Common on the Padang. Creeping in moss or over stumps or low bushes. Flowers white, the two central keels yellow.

Distribution. Selangor and Perak Hills (Gunong Kerbau).

*218. *CÆLOGYNE STENOCHILA*, Hook. fil.; Ridl. op. cit. p. 329. Common with the last and more abundant. Flowers brownish flesh-colour.

Distribution. Selangor and Perak Hills.

*219. *PHOLIDOTA PARVIFLORA*, Hook. fil.; Ridl. op. cit. p. 329. Top of Gunong Tahan and elsewhere high up on the Padang.

Distribution. Perak Hills.

220. *PHOLIDOTA ELIZABETHIANA*, n. sp.

Rhizome long, 6 inches or more. Pseudobulbs elongate, cylindric, blunt at the top, closely approximate and appressed to the rhizome, 2 inches long, $\frac{1}{4}$ inch wide. Leaves 2, linear, acuminate at both ends, apex shortly acuminate, acute, mucronate, narrowed gradually to the base, 3-nerved, thinly coriaceous, 9 inches long, $\frac{1}{4}$ inch wide. Scapes from the centre of the leaves of the young bulb, 4 or 5 inches long, graceful, erect; base about an inch, nude; raceme many-flowered; flowers distichous, white, small; rachis straight. Bracts lanceolate-acute, papery, $\frac{1}{8}$ inch long, longer than the flower-buds, caducous before the opening of the flower. Ovary and pedicel $\frac{1}{10}$ inch long. Upper sepal lanceolate, base gibbous, keeled. Petals oblong or ovate-oblong, shorter and thinner. Lip at the base cymbiform with short blunt lobes; mid-lobe broad, suborbicular, obscurely 3-lobed; margins crisp; disc thickened with two elevated, semilunar, fleshy ridges between the two side-lobes; centre of middle lobe thickened. Column short and broad; stelia short, distinct, tooth-like; rostellum

broad, rounded, entire. Anther wide, rounded, flat; apex rounded. Pollinia pyriform.

Gunong Tahan at 7,100 feet and Gunong Ulu Riang at 6,000 feet.

A pretty plant, remarkable for its narrow grassy leaves and close-set, small, white flowers.

221. *CYMBIDIUM* sp. A terrestrial plant growing on quartz rocks at 7,100 feet on Gunong Tahan, tufted; the roots hick, white, and corky. Leaves linear, lorate, blunt, keeled, 8 inches long to half an inch wide, coriaceous, the sheathing portion an inch long. Scape erect, nodding, 9 inches tall, covered with acuminate sheaths; raceme apparently few-flowered. Fruit large, ellipsoid, 2 inches long, with the persistent remains of the column. Apparently allied to *C. Finlaysonianum*, Wall.

222. *BROMHEADIA PUNGENS*, *Ridl.* On rocks near the Camp on the Padang. Rare and out of flower.

Distribution. Mt. Ophir.

223. *BROMHEADIA RUPESTRIS*, *Ridl.* This beautiful plant was common on the ridges above Wray's Camp up to the Padang, where however it was scarcer. The flowers are firmer in texture than in most of the genus. The sepals and petals were acute, cream-colour, the sepals tinted red on the back. The lip had long narrow lobes curved outwards at the tip; the mid-lobe oblong, the sides at the tip curved over to form a point. The lip is white, the sides and lobes spotted and streaked with purple. The column has the base white spotted with pink, the middle deep pink, and the apex yellow. The anther-cap is small, cap-shaped; pollinia globose with a crescent-shaped gland. The rostellum has two short incurved points and the stigma is large, transversely elliptic.

It also occurs on Mt. Ophir.

224. *SACCOLABIUM BIGIBBUM*, *Hook. fil.* On trees at the stream at the Ninth Camp. Not common.

Distribution. Perak hills and Kluang Terbang, also Burmah.

225. *SARCOCHILUS CRASSIFOLIUS*, n. sp.

Stem 6 inches tall, with 6 very fleshy leaves crowded at the top, elliptic, broadly bilobed, lobes rounded, very unequal, dark green, strongly keeled, $1\frac{1}{2}$ inch long, 1 inch wide. Racemes short, thick, an inch long; rhachis slightly flattened, green; bracts ovate, acute, flattened. Pedicels very short. Flower small, white. Sepals ovate-acute, greenish white, the upper one lanceolate. Petals lanceolate, obtuse, a little smaller. Lip pure white; side-lobes short, erect, subtriangular; mid-lobe none; spur broadly rounded, fleshy, with a bright brown blotch and a few in the mouth. Column short and broad, subtriangular, white.

On trees on the stream by the Ninth Camp. Rare. Allied to the next species, but with very different leaves and a shorter rounder flower.

226. *SARCOCHILUS VIOLACEUS*, n. sp.

Stem broad, flattened, 3 inches long. Leaves lorate, keeled, apex unequally bilobed, tips rounded, short, blunt, thickly coriaceous, dark green, purplish beneath, 4 inches long, half an inch wide. Raceme $1\frac{1}{2}$ inch long, lengthening gradually, subterete, with short-ovate bracts. Pedicels $\frac{1}{4}$ inch long. Flowers half an inch long; upper sepal lanceolate-acute, lower ones ovate-triangular, gibbous at base, whitish violet outside, violet within. Petals narrower, lanceolate-acute, violet. Lip white; side-lobes obliquely ovate, incurved; epichil low, indistinct; spur fleshy, ovate, subacute, with a brown bar near the mouth, and numerous white and some brown hairs within. Column stout, white, base brownish; stelia thick, incurved. Anther semiglobose. Stigma very small, subtriangular.

On trees along the stream at the Ninth Camp. Not common. A very distinct plant in its thick leaves and violet flower. The lip has much the shape of that of *Sarcochilus calceolus*. The roots are very stout and corky.

*227. *THRIXSPERMUM SCORTECHINII*, *Ridl. op. cit.* p. 330. Woods on the Camp stream, Padang. Not common.

Distribution. Malay Peninsula.

228. *PODOCHILUS SCIUROIDES*, *Rehb. fil.* Very common on trees in the woods on the Padang.

Distribution. Malay Peninsula.

229. *PODOCHILUS TENUIS*, *Lindl.* Mossy stones on the Padang woods. Not common. Leaves more spreading than usual. Out of flower.

*230. *ACRIOPSIS JAVANICA*, *Bl.*; *Ridl. op. cit.* p. 330. On trees, rare. Flowers not seen.

231. *HETÆRIA ELEGANS*, *Ridl. op. cit.* p. 330. Woods by the Teku, nearly out of flower. Endemic.

232. *CRYPTOSTYLIS ARACHNITES*, *Bl.* Wet woods by the stream on the Padang and near the Gully.

Distribution. India, Ceylon, Malay Peninsula, and Java.

*233. *HABENARIA ZOSTEROSTYLOIDES*, *Hook. fil.*; *Ridley, op. cit.* p. 330. Very common on the Padang, both in wet woods, where it attains the height of two feet with well-developed leaves on the stem, and in damp open spots on the Padang, where it is reduced to a height of 6 inches, with the stem-leaves reduced to little more than sheaths. It ascends to a height of 7,186 feet. Flowers bright green.

Distribution. Mt. Ophir and Perak hills.

*234. *CYPRIPEDIUM ROBINSONII*, n. sp.

Cypripedium barbatum, *Ridl. op. cit.* p. 330.

Stems frequently stoloniferous. Leaves few, about four, elliptic-oblong, subacute, glabrous, 3 inches long $1\frac{1}{2}$ inch wide, pale green with darker spots and transverse bars. Peduncle erect, over a foot tall, purplish, hairy, half an inch long. Flower solitary. Upper sepal broadly ovate, narrowed at the

base, apex somewhat abruptly acute, base dull purple, above pale green, darker at the edges and the tip, hairy, $1\frac{1}{2}$ inch long, $\frac{3}{4}$ inch wide. Lower pair shorter, ovate, pale green, acute, hairy. Petals 2 inches long, spathulate, broadest towards the tip, which is subacute, half twisted at the base, glabrous; margin dull yellowish green with a longitudinal purple central bar, many round spots. Lip glabrous, purplish, $1\frac{1}{4}$ inch long, $\frac{3}{4}$ inch wide. Anther orbicular, widely emarginate at the tip and retuse behind, yellowish with a green centre. Fruit cylindric, narrowed at each end, 2 inches long.

Common in woods near the streams, growing in deep moss, in shady spots at an altitude of 5,600 feet on the Padang.

Certainly allied to *C. barbatum*, Lindl., but distinct in the smaller abruptly, acuminate upper sepal and petals without hairs on the glandular dots. The leaves are much smaller than in most specimens of *C. barbatum*, Lindl.

APOSTASIACEÆ.

*235. *APOSTASIA NUDA*, Br.; *Ridl. op. cit.* p. 330. Banks of the stream at the Padang Camp.

Distribution. The whole Peninsula.

SCITAMINEÆ.

*236. *HEDYCHium COLLINUM*, *Ridl. op. cit.* p. 331. This beautiful and fragrant plant grows near the Gully and on the stream-banks on the Padang, but is not common. It has only been previously met with on Kedah Peak and is allied to *H. Gomezianum*, Wall.

237. [*ALPINIA PETIOLATA*, Bak. Was found near Wray's Camp at 3,300 feet. Occurs also in Perak.

238. *A. MURDOCHII*, *Ridl.* Also grows here. It was found in flower and fruit.]

239. *CAMPTANDRA TAHANENSIS*, n. sp.

Whole plant 5 or 6 inches tall, succulent. Sheaths four or five on the stem, lanceolate, acute, lower ones ribbed when dry. Leaves 2 to 4, ovate-acuminate, caudate, obliquely bright green, 3 to $3\frac{1}{2}$ inches long, $1\frac{1}{4}$ inch wide; petiole 1 inch long. Peduncle $\frac{1}{2}$ to $\frac{1}{4}$ inch long. Bract urn-shaped, top rounded, $\frac{1}{2}$ – $\frac{3}{4}$ inch long, green, containing two flowers. Calyx cylindric, $\frac{1}{4}$ inch long, truncate, slightly dilated upwards, reddish, persistent in fruit. Corolla-tube slender, half an inch long, protruding far from the top of the bract; lobes white, $\frac{3}{4}$ inch long, oblong. Lip large, obovate, with two yellow central semioval longitudinal keels. Capsule oblong, $\frac{1}{4}$ inch long.

Gunong Tahan, abundant in damp spots by streams, but nearly over in July. Allied to *C. ovalifolia*, Ridl., of Semangkok Pass, but with larger flowers, with longer tube to the corolla, and different lip.

The second flower in the bract opens about the time that the fruit of the first flower is ripe.

240. *CONAMOMUM SERICEUM*, n. sp.

Rhizome large, supported on stilt-roots. Leafy stems 8 feet tall. Leaves oblong-lanceolate, 18 inches long, 7 inches across, narrowed at the base, shortly cuspidate at the apex, glabrous except on the edges of the tip, dark green above, paler beneath; petiole short, grooved; ligule $\frac{1}{4}$ inch long, oblong, truncate, silky. Peduncles stout, 6-7 inches long, covered with 5 large, glabrous, ribbed, truncate sheaths, about 2 inches long. Spike cylindric, stout, 4 inches long, dense-flowered. Rachis hairy; pedicels half an inch long. Bracts urceolar, subulate, with an acuminate cusp, pale, papery, silky, containing 2 flowers on short pedicels, the second enclosed in another and smaller bract. Outer bract 1 inch long. Calyx tubular, thin, papery, prolonged at one side into a cusp, glabrescent, half an inch long. Corolla-tube short, hardly as long as the calyx; lobes elliptic, oblong, white, shorter than the stamen, obtuse. Lip 3-lobed, ovate; lobes not deeply cut and subequal in length, yellow, darker on the mid-lobe, base and side-lobes spotted with pink. Anther oblong, crest 3-lobed, central lobe oblong, truncate or rounded, side-lobes oblong, truncate or curved, slightly acuminate, white tinted and spotted with pink. Fruit not ripe, elliptic, ribbed when dry, glabrous.

Gunong Tahan, in damp woods in the Gully and in the woods bordering the streams in the Padang. Common.

This species is allied to *C. citrinum*, Ridl., of the Taiping Hills, and Bujong Malacca, differing in the papery, cuspidate, pubescent bracts, the form of the lip (which is much more distinctly lobed), silky ligule, etc.

*241. *GEOSTACHYS ELEGANS*, Ridl. *op. cit.* p. 331. Common in the drier part of the woods on the upper slopes above the streams. Also collected by Robinson. In many plants the leaves are of a brilliant purple beneath, very attractive. The corolla is yellow, the lip darker in colour, and there is a pair of short linear crimson staminodes at the base. There are two flowers in each bract, which I find also in some, at least, of the type-form from Mt. Ophir.

The only other locality for this plant at present known is Mt. Ophir.

AMARYLLIDÆ.

242. *CURCULIGO LATIFOLIA*, Dryand.; *antea*, p. 59. Narrowed-leaved form. Wet woods of the Teku, 4,600 feet elevation.

Distribution. Burmah, Andamans, whole Peninsula, and Malay islands; common, but seldom at any great altitude.

BURMANNIACEÆ.

*243. *BURMANNIA LONGIFOLIA*, Becc.; Ridl. *op. cit.* p. 331; *antea*, p. 59. Abundant in damp shady spots all over the Padang, and along the ridges from about 4,000 feet upwards. The flowers are white with blue corolla and calyx-lobes.

Distribution. From Borneo (Sarawak) all over the Malay Peninsula at an altitude of 3,000 to 6,000 feet. Absent from Mt. Ophir.

*244. *BURMANNIA DISTICHA*, L.; *Ridl. op. cit.* p. 331. Common all over the Padang, except in very dry spots. Flowers light blue.

Distributed over the mountains of Australia, China, Sumatra, Ceylon, and Kasiya; in the Malay Peninsula only seen from Mt. Ophir and Kedah Peak.

I have in vain sought for any insect visiting this plant and *B. caelestis*, Don. The petals and sepals in *B. disticha* remain connivent the whole day, but are most widely separated about midday, leaving only a narrow opening for an insect to pollinate it.

245. [*BURMANNIA TUBEROSA*, Becc. Occurs at Kuala Teku in muddy spots on the banks of the Teku River. It is scattered all over the Peninsula in the low country.]

LILIACEÆ.

246. *PROTOLIRION PARADOXUM*, *Ridl. & Groom, antea*, p. 59. Common in wet woods on the Padang to 6,000 feet elevation. As usual associated with *Dacrydium*.

Distribution. All high hills in the Peninsula where these conifers grow.

247. *DIANELLA PARVIFLORA*, n. sp.

Habit of *D. ensifolia*, Red. Stems one or two, about 6 inches long, covered with distichous leaves from the base and flattened slightly. Leaves linear-acuminate, coriaceous, usually revolute at the margins when dry, armed with short thorns on the midrib and the margins for the whole length, 12 to 18 inches long, $\frac{1}{2}$ inch wide. Panicle terminal, elongate, lax, 14 inches long, with a single, lanceolate, acute sheath halfway up; branches few and short, about half an inch long. Bracts lanceolate-acuminate, a quarter of an inch long. Flowers 4 or 5 together a quarter of an inch across. Sepals ovate-obtuse. Petals longer, elliptic-obtuse, all blue in the centre, fading off to dirty white at the edge, spreading, not reflexed. Stamens shorter than the petals; filaments short, white, abruptly dilated above into a yellow swelling. Anther brown, dehiscing at the apex only. Ovary shining green. Style cylindric, white. Berry deep blue.

This species is distinct from *D. ensifolia*, Red., the common lowland species, in its smaller flowers, shorter and differently shaped stamens, ovate sepals, and longer petals. When dried, it might easily be mistaken for *D. ensifolia*. This plant is recorded from Mt. Kinabalu at 7,000 to 8,000 feet altitude by Dr. Stapf in the 'Flora of Mt. Kinabalu.' It is improbable that this lowland and sea-shore plant should occur at such an altitude. May the Kinabalu plant not be *D. parviflora*, Ridl.?

248. *RHUACOPHILA JAVANICA*, Bl. *Enum.* i. 14; *antea*, p. 59.

Stems usually numerous, 6 to 8 feet tall, strongly flattened. Leaves rather flaccid, glaucous, subcoriaceous, linear, acuminate, unarmed, midrib very inconspicuous. disappearing

altogether towards the tip, 12 inches long, 5 inches wide, or in younger plants smaller. Panicle terminal, 3 to 6 inches long, sessile (*i.e.*, there is no bare peduncle as in the other species); branches numerous, 3 inches or less, with lax secondary branches, elongating in fruit to half an inch long. Bracts at base of primary branches leaf-like, lanceolate, broad. Bracteoles small, lanceolate or ovate-lanceolate, papery. Flowers white, on short pedicels, a quarter of an inch long. Sepals oblong-obtuse, tip rounded, 3-nerved. Petals nearly as long but wider, 5-nerved. Stamens shorter; filaments linear, rather thick, flat, half as long as the elongate linear obtuse anther; base of anther shortly bifid, yellow. Ovary small, ovoid. Style cylindric, fairly stout, as long as the petals. Stigma small, capitate. Berry oblong, half an inch long when dry. Seeds 4 in each cell, ellipsoid, slightly flattened towards the base, $\frac{1}{10}$ inch long, black, shining.

On rocks in the Teku River and its affluents, occasionally on banks, altitude 5,600 to 6,000 feet.

I have also fruiting specimens from Mohammed Aniff, of the Penang Gardens, from Gunong Kerbau at 7,000 feet altitude. Of flowers I have only seen one spray, and those not opened. They differ from those of *Dianella* in the linear filaments not swollen at the top and the elongate anthers. The fruit, too, with its more numerous and small ellipsoid polished seed is quite unlike that of *Dianella*. From *Stypandra* it mainly differs in its glabrous stamens and its baccate fruit. The perianth dries over the fruit and is not twisted.

This distinct plant was referred to the genus *Dianella* by Kunth under the name of *D. javanica*, and to *D. ensifolia*, Red. by Baker. It occurs also in Java and Borneo; on Gunong Kerbau, Perak, 4,500—5,000 feet and on Koh Pennan off the coast of Bandon, Siamese Malaya.

249. *SMILAX PEGUANA*, DC.

Unarmed; stem smooth, brown, wiry, $\frac{1}{8}$ inch across. Scales at the base of the branches oblong, truncate, or lanceolate. Leaves coriaceous, ovate with rounded base, occasionally cuneate-acuminate or, more rarely, lanceolate, occasionally narrow-oblong, 3 inches long by 2 inches wide or less, above bright green (olivaceous when dry), beneath white, drying glaucous; nerves 5, conspicuous on both surfaces, reticulations conspicuous; petiole half an inch long, with a pair of short tendrils. Peduncles axillary, a quarter of an inch long in flower, bearing an umbel of 5 or 6 flowers on pedicels as long. Sepals rather coriaceous, ovate obtuse. Petals much smaller, lanceolate, obtuse, narrow. Stamens shorter, on very short filaments. Anthers broadly elliptic. In fruit peduncles elongated, 1 inch long; pedicels $\frac{1}{4}$ inch long. Berry (nearly ripe) globose, green, $\frac{1}{4}$ inch through.

Common in the woods in the Padang, but out of flower at the time of our visit. I have not seen this before from the Malay Peninsula, but have exactly the same plant from Matang collected by Hullett and from Mt. Serapi collected by Haviland,

both localities in Sarawak. The leaves are very variable in shape, the fully developed ones being ovate. I refer this plant, very variable as it is in leaf, to *S. peguana* of Burmah, as described in the 'Flora of British India.'

250. *SMILAX LÆVIS*, Wall. Woods on the Padang, in fruit only. It occurs on all our higher mountains from 2,500 to 5,000 feet and also in China.

XYRIDEÆ.

*251. *XYRIS GRANDIS*, Ridl. *op. cit.* p. 332. This remarkable plant occurs very abundantly in damp spots by streams from Wray's Camp to the Padang, 3,300 to nearly 6,000 feet elevation. It grows in shady woods, the flowers are small in proportion to the size of the plant, dark yellow, the base of the corolla is tubular. Stamens, 3 fertile and 3 sterile. It is pollinated partly at least by the *Bombus*. Endemic.

*252. *XYRIS RIDLEYI*, Rendle; Ridl. *op. cit.* p. 332. Extremely abundant all over the Padang in slightly damp spots. A most attractive little plant with its bright yellow flowers. It varies much in size, and in damp sunny spots attains a height of over a foot with bright red stems. It also occurs on Kedah Peak in grassy spots.

TRIURIDEÆ.

253. *SCIAPHILA AFFINIS*, Becc. *antea*, p. 59. From Wray's Camp to the stream on the Padang.

Distribution. Whole Peninsula and Borneo.

254. [*SCIAPHILA ASTERIAS*, n. sp.

Stems slender, 10-11 inches tall. Leaves lanceolate-acuminate, $\frac{7}{10}$ inch long, not sheathing. Raceme lax; flowers distant, white. Bracts $\frac{3}{4}$ the length of the pedicel, which is $\frac{1}{2}$ inch long. Perianth $\frac{1}{4}$ inch across; lobes nearly equal, linear, subulate, very narrow from a broader lanceolate base. Stamens in the male flower 3, orbicular or oblong, sessile, closely approximate, glabrous. Female perianth shorter; carpels numerous, oblong, clavate, papillose, whole head $\frac{1}{10}$ inch across. Wray's Camp at 3,300 feet.

Allied to *S. major*, Becc., but the perianth-lobes are much longer and narrower.

255. *SCIAPHILA MAJOR*, Becc. Wray's Camp at 3,600 feet.

Distribution. The Malay Peninsula and Borneo.]

PALMÆ.

256. *PINANGA BREWSTERIANA*, n. sp.

A tufted or solitary stemmed palm with the stems attaining a height of about 6 feet and a diameter of about half an inch, reddish brown. Leaves usually simple, occasionally lobed; sheaths 7 or 8 inches long, scurfy, dark brown; petiole 6 to 12 inches long, stout, brown, scurfy; blade obcuneate, narrowed to the base, apex deeply bilobed (more rarely with a pair of

lobes at the lower part); terminal lobes with 9 or 10 acute teeth about an inch long and half an inch wide at the base; whole blade about 2 feet long and 8 inches across in the widest part; terminal lobes 6 inches long; nerves and midrib very prominent on both surfaces, above dark green, beneath glaucescent. Spathes boat-shaped, about 6 inches long. Spadix 2-3 branched; peduncle 3 inches long; branches 4 inches wide, densely covered with reddish wool. Flowers spirally arranged, remote. Male flower $\frac{1}{8}$ inch long; petals triangular, acuminate. Female $\frac{1}{8}$ inch long, subglobose. Sepals orbicular, striate, glabrous. Fruit (not quite ripe) olive-shaped, half an inch long. Seed nearly as long, base blunt, ribbed externally. Albumen ruminant, with rather large intrusions running nearly to the centre.

This palm is the only one, except two *Calameæ*, occurring on the Padang. It is abundant in all the wet woods from below the Gully to nearly 6,000 feet elevation. It constantly emits lateral buds from the stems. I had a great difficulty in finding any male flowers, till by cutting into a leaf-sheath that appeared to be swollen I found a much decomposed spathe with some rotten flowers on the spadix, and the female flowers, though not yet free from the leaf-sheath, were fairly developed. I suspect that this palm is usually self-fertilized before the spathe opens. Spadices with female flowers and young fruit were abundant. The rachis of the spadix is red and the fruits apparently black when ripe.

*257. [*LIYISTONA TAHANENSIS*, Becc. Abundant by Wray's Camp up to about 4,000 feet, when it disappears. Endemic.]

258. *CALAMUS ELEGANS*, Ridl. Abundant from round Wray's Camp to about 7,000 feet on Gunong Tahan. A slender rattan of no great length, probably the highest-growing palm in the Malay Peninsula.

Distribution. Bujong Malacca, in Perak.

259. [*EUGEISSONA BRACHYSTACHYS*, n. sp.]

A bush-palm smaller than *E. tristis*. Leaves erect, 14 to 20 feet long, the petiole terete, 12 feet long, an inch through, glaucous green finely speckled with dull red, with two rows of short spines, one on the back and one on the front; spines black, half an inch or less long, in pairs, one pointing upwards, the other downwards; leaflets deep green, alternate, lanceolate, caudate, broad, base shortly narrowed, 2 feet long, 3 inches wide; tail 4 inches long, midrib raised, nerves 14; rachis, back rounded, upper surface flat. Flower-spike about 3 feet tall; peduncle short, stout. Spathes broad, lanceolate, cuspidate, clasping the stem, base green above, red, scurfy, with short erect black spines increasing in length towards the apex; cusp acuminate, 6 inches long; upper sheaths shorter, about 15 in number. Lower flowers paniced, upper branches racemose, on peduncles of dark brown ovate bracts; peduncles $1\frac{1}{2}$ inch long. Calyx cylindric, irregularly lobed, green. Petals narrow,

linear, acuminate, 2 inches long, green. Fruit ovoid, shortly broadly stipitate at base; apex abruptly beaked; beak half an inch long, obscurely trigonous; scales ovate, triangular, obtuse, margins paler, thin, shortly fimbriate.

On the drier part of the hill at Kuala Teku.

A very distinct plant from the only other Peninsular species, *E. tristis*, Griff., in its smaller clumps, broad leaflets, and short inflorescence. It only occurs on the drier parts of the hills and woods at Kuala Teku.]

ARACEÆ.

260. *HOMALOMENA ANGUSTIFOLIA*, Hook. fil. Abundant in cracks in the rocks of the Teku River to a height of about 5,000 feet. There are two forms, the ordinary long-leaved form with leaves 5 inches long on a four-inch petiole, and a dwarf form forming dense mats 2 to 3 inches high. This form has spathes as big as those of the taller plant, and both have cusps rather longer than usual.

It occurs in mountain-streams all over the Peninsula, varying in form according to the rapidity of the stream at its place of growth.

261. *HOMALOMENA PUMILA*, Hook. fil. *antea*, p. 60. Wet woods on the first stream on the Padang; local.

Common in the Malay Peninsula from sea-level to about 4,000 or 5,000 feet elevation; also Borneo.

*262. *SCINDAPSUS SCORTECHINII*, Hook. fil.; Ridl. *op. cit.* p. 332. Woods on the Teku, where it joins the stream from the Camp, and a short way up that stream. Collected here also by Robinson. Out of flower in July.

Usually common on rocks and trees at 3,000 to 4,000 feet in Selangor, Perak, and Kedah, but not common on Gunong Tahan. It does not seem to go over 5,000 feet elevation.

PANDANACEÆ.

263. *PANDANUS KLOSSII*, n. sp.

Stems usually solitary, 8 to 20 feet tall, 3 inches through, rounded, grey and bare, leafy at the top only. Leaves linear, somewhat abruptly cuspidate, over 5 feet long, 3 inches wide, hard and coriaceous, with strong black-hooked or ascending thorns $\frac{1}{4}$ inch long along the edge and keel to the lower part, smaller and closer-set on the edges upwards, very small and close on the cusp. Cusp slender, stiff, 1 inch long. Capitulum globose or oblong, as big as the head, on a short stout peduncle 6 inches long, breaking up into syncarps of 6 or 7 fruits, $2\frac{1}{2}$ inches long, above bluntly angled; apex of fruit shortly free, truncate, obscurely angled, and cone-shaped. Style $\frac{1}{8}$ inch long, slightly bent, acute, dark brown, simple or branched, broad with two spreading points. Stigma linear for the whole length.

Common all over the Padang. In the more open exposed spots the stem is short and erect, about 6 to 8 feet tall; in the woods the stems are long and weaker, often falling about at

all angles, 20 feet or more long. The capitulum is large and showed signs of turning red or orange; the drupes are separate till the fruit is nearly ripe, when from 6 to 7 become adnate and remain so as the whole fruit breaks up.

I do not know any pandan like this in the Peninsula. The fruit when ripe has the appearance of that of *P. fascicularis*, but it has thorn-like stigmas belonging to a different section. The stigmas are often simple, acute, thorn-like processes, but frequently also on the same head are broad, flat, and bifurcate at the lip, with recurved points like those of *P. bicornis*, Ridl.

No trace of male flowers could be seen anywhere. The plant is very abundant, almost filling up the woods in some places.

264. FREYCINETIA sp. A large and stout species of *Freycinetia* is abundant in the Teku woods. No signs of inflorescence were seen, but it resembled *F. valida*, Ridl.

ERIOCAULACEÆ.

*265. ERIOCAULON HOOKERIANUM, Stapf.

Eriocaulon macrophyllum, Ridl. op. cit. p. 332.

Dry spots on Gunong Riam, 6,000 feet altitude, and on summit of Gunong Tahan, 7,100 feet. This exactly resembles the type-plants of Kinabalu collected by Haviland. I find the petals of the male flower very unequal, one being considerably longer than the other.

In the lower-lying and damper parts of the Padang there is another plant which differs from this species in having a less distinct stem and thin long flaccid leaves, but of which the flowers bear a very close resemblance to those of *E. Hookerianum*, and it is possible that it is a lowland form of that species. In the previous paper I named this *E. macrophyllum*, Ruhl., only known from a Javan specimen collected by Warburg, but closely resembling a Javanese plant collected by Horsfield and now in the British Museum. (It is always regrettable that so many authors of the 'Pflanzenreich' volumes appear to have omitted to inspect the largest and most important herbaria of Kew and the British Museum.)

I think, however, this plant is probably not the plant intended by Ruhl. for his *macrophyllum*, and I cannot find any description to exactly suit this lowland species. I will describe it herewith, and give it a name:—

266. ERIOCAULON SILICICOLUM, n. sp.

Stem very short, herbaceous, covered by the bases of the leaves. Leaves linear, flaccid, herbaceous, acute, 5 to 8 inches long, $\frac{1}{8}$ to $\frac{1}{4}$ inch wide, with a few sparse hairs soon disappearing. Scapes 1 to 3 in a tuft, slender, erect, 12–18 inches tall, glabrous, ribbed. Spathe at base tubular, 4 inches long, with lanceolate elongate limb. Capitulum $\frac{1}{4}$ to nearly $\frac{1}{2}$ inch across. Involucral bracts oblong, rounded at the tip, pubescent. Male flowers: bracts cuneate, apex rounded, pale translucent, apex thickly covered with white hairs. Perianth stalked. Sepals oblong, cuneate, tipped with white hairs and black-dotted,

connate for most of their length. Corolla hardly longer; lobes 3, very unequal, one twice as long as the other two, all crested with white hairs. Stamens with pale whitish filaments; anthers rather large, black, little longer than the shorter perianth-lobes. Female flower: sepals as in the male. Petals free to base, linear, with long white hairs all over. Capsule trilobed, globose. Seed oblong, obtuse at both ends. Style elongate, slender.

In damp spots on the Padang.

Certainly near *E. macrophyllum*, Ruhl., from description, but the unequal male petals are those of *E. Hookerianum*, and the leaves are always shorter than the culm.

CYPERACEÆ.

267. *SCIRPUS CLARKEI*, Stapf. Abundant in cracks of rocks in the streams on the Padang. This slender sedge forms good-sized tufts in the rapid torrents, the culms being often pendent in the water. I find the nut distinctly trigonous and narrowed at the base, dilated upwards, where it ends abruptly in a short beak, the style base. Stapf describes it as "obovato oblongo.....dorso convexo leviter carinata, facie subplana."

It was first obtained in Kinabalu by Haviland, and has not been found elsewhere.

268. *ACTINOSCHÆNUS FILIFORMIS*, Benth var. *RUPESTRIS*. A dwarf tufted form, 6 inches tall, with very slender erect stems and capitula hardly an inch across.

Common on one or two of the rocky slopes between the Camp stream and the top of Gunong Tahan. I have the same form from Gunong Dai in Lingga, collected by Mr. Hullett, and from the top of Ben Karum in Sarawak by C. J. Brooks.

The usual form of the species has long pendent or weak stems often twice as thick as in this and has larger capitula. This form occurs in Hongkong, Ceylon, and the Karimon and St. Barbe Islands, the waterfall, Taiping, Mt. Ophir, Penang Hill, and Kedah Peak.

269. *CLADIUM PULCHRUM*, n. sp.

Rhizome short, woody; base of stem swollen, covered with broad red-brown sheaths. Leaves coriaceous, linear, obtuse, narrowed upwards, base dilated, margins denticulate, scabrid or smooth, 6 to 9 inches long, $\frac{1}{12}$ inch broad, dilated, base $\frac{1}{4}$ inch wide. Inflorescence 10 to 14 inches tall; peduncle glaucous, terete. Panicle bracts at the base 1 inch long, narrowly linear, base dilated, sheathing, deep red. Rachis flexuous. Branches few, 6 or 7, about half an inch long, crowded spikelets on short angled peduncles. Lower glumes empty, 3, two basal, broadly lanceolate, cuspidate, strongly-nerved, red; upper much longer, more narrowly lanceolate, acute, dark red, fertile; glume lanceolate, as long as the previous one. Stamens 3; filaments linear; anthers narrow, linear, yellow. Style long. Stigmas 3. Bristles 3, narrowed upwards, pubescent, half as long as the nut. Nut (not ripe) narrowed into the style.

Abundant on the Padang in slightly damp spots. In more shady spots the bracts are more green, and there is a slight tendency to lengthening of the panicle. This species is undoubtedly near to *Cl. undulatum*, Thw. (*Tricostularia fimbriatylodes*, Benth.), but that is a much more elongate tall plant forming great tussocks of long leaves in sandy spots at Pekan, Setul, etc., and occurring in Ceylon. This plant is short, dense and reduced, and has the habit of a rush, and there are also distinct differences in the form of the glumes.

270. *CLADIUM MAINGAYI*, Clarke. Very common on the Padang. Occurs also on Mt. Ophir and on Gunong Bubu in Perak, otherwise only known from Celebes.

271. *LEPIDOSPERMA CHINENSE*, Nees. Common all over the Padang up to the summit of Gunong Tahan. Also occurs in Mt. Ophir and Gunong Kerbau, collected by Mohammed Aniff at 7,000 feet elevation.

Distribution. South China.

The typical form with fairly stout glaucous stems, attaining a height of six feet, grows among *Gleichenia* and other fairly tall plants in damp thickets as high as 7,186 feet altitude. On the open bare Padang in cracks in rocks and among the quartz-fragments grows another form extremely abundant, much reduced, and dwarfed, for which I propose the varietal name of var. *alpina*. Dwarf tufted plant, 6 to 8 inches tall; stems rigid, obscurely angled, as are the leaves. Leaves acute, almost pungent, nearly as long as the flowering stems. Panicle an inch long, denser, with very short branches much reduced. Hypogynous bristles ovate-acuminate, broader than in the type.

Very different in appearance and habit from the tall rush-like type, with its terete, rather pithy stems, and elongate slender panicle, 3 inches long, with branches of several spikelets, but it seems only a dwarfed, stiffer, and reduced alpine form.

272. *RHYNCHOSPORA GLAUCA*, Vahl. On slightly damp spots on the Padang. A very slender form.

Distribution. All the Tropics, except India.

273. *GAHNIA JAVANICA*, Mor. *antea*, p. 60. Common on the Padang. In open rocky spots it develops a stout ropelike prostrate stem about 3 feet long covered with leaf-bases and roots. This usually lies in a curve on the ground. The inflorescence of this Padang form is thin and poor compared to the robust panicles of the plants grown in better soil.

Distribution. From Fiji and New Caledonia, through the Malay Archipelago and Peninsula, to Kedah Peak, from 1,500 to 7,000 feet. And on Gunong Kerbau, Perak, 5,500-6,600 feet.

274. *GAHNIA TRISTIS*, Nees. Not common here. It occurs also on the ridges by Wray's Camp. This plant is common near the sea-coast in Singapore, Johore, etc., and also on the mountains of Ophir and Kedah Peak.

275. *SCHÆNUS DISTICHUS*, n. sp.

A small tufted plant, forming small clumps; the stem erect, from less than an inch to 6 inches or more long, branched, and terminating in flattened branches with distichous close-set leaves. Leaf-bases coppery, above bright green, linear, triquetrous, scabrid, stiff, 1 to 6 inches long and $\frac{1}{2}$ inch or less thick. Inflorescence shorter than the leaves, from one of the upper axils. Culm slender, strongly curved, bearing 2 or 3 sheathing leaves. Sheaths with a broad scarious margin; back green, grooved; from the sheath rise one or two branches half an inch long, angled, scabrid, bearing one fusiform spikelet $\frac{1}{8}$ inch long. Glumes 4, imbricate, lanceolate, maculate, deep violet-purple, keeled; lower ones empty, terminal one only fertile. Style trifid, slender, purple. Nut pale pyriform, covered with the pericarp, obscurely 3-angled and beaked; hypogynous bristles none.

Padang, abundant, but seldom in flower; Perak, Gunong Kerbau, 7,000 feet altitude (*Aniff*, May 1910). *

This remarkable little sedge, with its leaves forming small fans, was very abundant on the Padang in dry or slightly damp spots. It forms clumps a few inches across, and in most places was only an inch or two high. I found it larger in damper shadier spots under bushes on the summit of Gunong Tahan, and the specimens sent from Gunong Kerbau by Mohammed Aniff were very much larger, having a stout stem six inches long and leaves of equal length.

The flowers were difficult to find, and it does not seem to be at all floriferous. It only bears a few spikelets on its very short culm. The spikelets resemble those of other species of the genus, but there are no visible hypogynous bristles. I do not know any plant resembling it.

276. *SCLERIA CARPHIFORMIS*, n. sp.

Stems 2 to 3 together in a tuft, thick at base, covered with hairy red sheaths about one inch or less long, lower sheaths split on one side with a lanceolate point on the other. Leaves 3 or 4, linear, obtuse, 6 inches long, $\frac{1}{8}$ inch wide, glaucous green with long white hairs on the edges and keel. Panicle shorter, 2 inches long, with two or three distant fascicles of spikelets, subsessile, or the lower one shortly pedicelled. Bracts leafy, the upper-most one elongate, $1\frac{1}{2}$ inch long, resembling an ordinary leaf. Spikelets 2 or 5 together, 2 to 3 males to one female. Male spikelet $\frac{1}{4}$ inch long, subterete; glumes dark red with white hairs. Four lower glumes narrowly lanceolate-cuspidate, empty; four terminal ones similar, but each containing 3 stamens. Filaments bright red, longer than the glumes. Anthers very narrow, linear, long, minutely cuspidate. Female spikelet shorter and thicker, with 4 bracts, the lowest ovate, lanceolate, but the others lanceolate, reddish, all with white hairs. Flower solitary. Style slender, trifid. Nut hemispheric with a broad base, $\frac{1}{10}$ inch long, white, thickly sprinkled over with pustules bearing brownish hairs stellately arranged. Disc large, flat, orbicular.

In slightly damp spots on the Padang beyond the 8th Camp, local, but abundant. It also grows on Kedah Peak. This was named by me *Scl. Neesii* in the "Materials." Mr. Clarke, to whom I had referred it, states that it appeared to be a variety of that Ceylon species, but might be made a new species. I obtained a better set of this curious plant on Gunong Tahan, and find it differs markedly from the Ceylon species, not only in habit, smaller panicle, and other such points, but in the fruit, which in the Ceylon plant is described as "very small, $\frac{1}{20}$ to $\frac{1}{16}$ inch, globose, echinate, disc obscure." In our plant the nut is twice as large, pustular, with brown hairs on the pustules, and seated on a large conspicuous disc. The Kedah Peak plant is much less hairy than that from Gunong Tahan, and more weak—probably these differences are due to the surroundings. The Kedah Peak one was growing in a grassy spot surrounded by forest, that of Tahan on slightly damp exposed rocks and screes.

277. *SLERIA RADULA*, Hance; *antea*, p. 60. A tall plant, often over 6 feet high; stem with a distinct but low wing, stout, over $\frac{1}{4}$ inch through. Leaf sheath-mouth with a hemispheric rounded lobe opposite the leaf-blade; blade linear-acuminate, 18 inches long, half an inch wide, margins and midrib scabrid. Panicles spreading, two inches long and as wide, lax, on peduncles two inches long; slender terminal panicle larger and more lax. Bracts elongate, almost setaceous from a broader hairy base, about $\frac{1}{4}$ inch long. Spikelets deep purple, one female at the base of the branch and 2 or 3 males above, rather distant. Rachis triangular. Female spikelet with ovate-acute glumes, $\frac{1}{8}$ inch long. Males cylindric, terete, $\frac{1}{8}$ inch long. Glumes lanceolate, all deep red. Nut globosely ovoid, white, quite smooth, $\frac{1}{4}$ inch long, base broad. Disc conspicuous, white, three-lobed; lobes subacute, margins between decurved.

Wooded stream-banks on the Padang.

Near and much resembling *S. elata*, Nees, in habit, but the nut is quite smooth and the disc large. The whole plant has the purple colouring that all this set of mountain-form *Sclerias* possess.

Distribution. Hongkong and Perak (Gunong Kerbau, 4,200 feet.)

278. *CAREX RIVULORUM*, n. sp.

A tufted plant, emitting stolons. Leaves linear-acuminate, 2 feet long, $\frac{1}{4}$ inch wide; base purplish brown, minutely scabrid on the back; midrib prominent. Culm 3 feet long, very slender, weak, terete. Foliaceous bracts sheathing, very narrow, longer than the lower spikes. Spikes 6, pedunculate, very slender, cylindric, an inch long, $\frac{1}{10}$ inch through, lower ones all female, or with male flowers at the tip; upper one male only. Glumes ovate, lanceolate, keeled, with a long mucro, as long as the utricle, pale brown, minutely pubescent, edges and mucro scabrid. Utricle $\frac{1}{4}$ inch long, fusiform,

narrowed and stipitate at the base, prolonged above into a long beak, triquetrous, ribbed, and densely hairy with appressed hairs; mouth bifid. Style long, projecting far beyond the beak, hairy. Stigmas 3, long. Nut shorter, fusiform, triquetrous, narrowed at both ends, base of style not thickened, dark brown.

Mossy wooded stream-banks on the Padang. Nearly out of flower. Altitude 5,600 feet.

Allied to *C. fusiformis*, Nees, but with hairy utricles; possibly only a variety of that species.

279. *CAREX LIGATA*, *Booth*. In damp woods along the stream from Gunong Riang and Gunong Tahan in shady spots, local but abundant.

Distribution. From Formosa to China. Not previously recorded from the Malayan region.

280. *CAREX LINDLEYANA*, *Nees*, var. A tall sedge forming large tufts by the banks of the same stream as the last, but in more open spots, less hairy than the typical plant, which occurs in Southern India and Ceylon. New to the Peninsula.

GRAMINEÆ.

281. *ISACHNE ALBENS*, *Trin*. In woods by a stream, Gunong Tahan, local. Occurs in the Larut Hills, Gunong Semangkok, and Telom, from 3,000 feet altitude upwards.

Distribution. India, China, and Malay Islands, and in the Malay Peninsula on the top of the Larut Hills.

282. *ISACHNE JAVANA*, *Nees*; *antea*, p. 61. Abundant in the Padang, but scattered, also seen on a ridge near Wray's Camp. The leaves are very strict and erect, white beneath. Altitude 3,400 to 7,000 feet.

Var. *SAXICOLA*. A densely tufted plant with numerous short stems 3 inches high; leaves half an inch long and more flaccid; panicles short and simple. Glumes I and II narrower and acuter than in type, often purplish.

This grows in the cracks of the stones in the streams, and, though very different in appearance from the type-form, I find connecting forms and conclude it is merely a form modified by its habitat.

Isachne javana occurs in Burmah, Java, and Borneo, and in the Malay Peninsula on Mt. Ophir, Gunong Bubu, Gunong Kerbau, 6,600 feet, Gunong Batu Puteh, and in Penang.

GYMNOSPERMÆ.

CONIFERÆ.

*283. *AGATHIS FLAVESCENS*, *Ridl*.

A tree about 40 feet or less on the open woods of the Padang, with a diameter of a foot or less at the base of the trunk; branches spreading, few, yellow. In the lower woods of the Teku of much larger size, trunks occasionally as much as two feet through and a large coma of deep green leaves. Leaves elliptic, narrowed at the base, apex rounded, blunt, very

coriaceous, shining yellow above, paler and not shining beneath (green in shady woods), 2 to $2\frac{1}{4}$ inches long, $\frac{1}{2}$ to 1 inch wide. Male spikes $1\frac{1}{2}$ inch long, $\frac{1}{4}$ inch in diameter, cylindric, obtuse; antheriferous scales $\frac{1}{8}$ inch across the top, $\frac{1}{8}$ inch long; limb nearly orbicular, edges rough. Pollen-sacs few. Cone globose, apex rounded, $2\frac{1}{4}$ inches long, 2 inches through. Scales $1\frac{1}{4}$ inch long, 1 inch wide, broadly obovate; the base trilobed; the two side-lobes acute, incurved; the central lobe oblong; limb narrow, hardly $\frac{1}{4}$ inch wide, elevated in the centre slightly. Seed elliptic, rounded at both ends, flattened, $\frac{1}{2}$ inch long, $\frac{1}{4}$ inch wide; wing large, broad, and rounded at the tip, half an inch or more long.

On the Padang and in the woods near the Teku, and along the ridge towards Skeat's Camp.

The biggest tree on the Padang, though barely 40 feet tall, attaining a larger size in the damper woods, but not as tall as the species on the Penang and Perak Hills. Where exposed the branches and leaves are of a curious yellow colour and very coriaceous, glaucous beneath, the edges reflexed.

It is most closely allied to *A. regia*, Warburg, of Batchian, but the leaves are not lanceolate and acute as in that species. The male cone and the antheriferous scales closely resemble the cone of that species, but the scales of the female cone have a much narrower limb and the base is usually distinctly trilobed, the side-lobes being acute and curved in. The wing of the seed is usually large and broad.

In previous papers I referred this species collected, first by Robinson, to *A. loranthifolia* (*rhomboidalis*, Warburg) of Penang Hill, but, on seeing the plant alive and procuring a nearly ripe cone and male spikes, I find it cannot be classed with that one. The male spikes are smaller than in any other species known to me except *A. regia*, Warb.

*284. *DACRYDIUM ELATUM*, Br.; *Ridl. op. cit.* p. 333. On the Padang in small woods. The trees are of no great size, and it is less common than the next species.

285. *DACRYDIUM BECCARII*, Parl. A shrub or bush, hardly a tree, very common on the Padang, and flowering and fruiting when only 5 feet tall. In this plant the leaves on the flowering shoots are shorter and thicker than those of the barren stems, but not reduced to scales like those of *D. elatum*. The male spikes were either dried or just commencing growth at the time of our visit. They were $\frac{1}{4}$ inch long and rather stout. The antheriferous scales, elongate, lanceolate, $\frac{1}{8}$ inch long. The fruit in the female trees in borne on the ends of the branches, single or 2 or 3 together, and hardly longer than the shortened leaves which surround them. The ovules are inch long, obovoid, shortly acute at the tip, deep black-purple, shining at the tip.

Distribution. Borneo, Mt. Ophir.

286. *DACRYDIUM FALCIFORME*, Pilg. Common in the woods of the Padang, but the trees quite small. I saw none

nearly as large as those of Gunong Semangkok. The male spikes were dried up and young ones just commencing growth. The dried adults $1\frac{1}{4}$ inch long, $\frac{1}{8}$ inch thick, cylindric; the antheriferous scales triangular, rather long acuminate.

Distribution. Borneo and Selangor Hills.

287. *PODOCARPUS NERIIFOLIUS*, *Don* (*P. bracteatus*, *Bl.*, *Ridl. op. cit.* p. 333). A tree about 20 feet tall with few branches. The peculiarity of this form is that all over the Padang, where it is common, the leaves, which are rather longer and thicker than in most forms, are deflexed, so that at first the tree appears to be dead. In the denser woods the leaves were more normal.

Distribution. Nepal, Malay Peninsula and islands to New Guinea, China, and Yunnan.

*288. *PODOCARPUS CUPRESSINUS*, *Br.*; *Ridl. op. cit.* p. 333. I only found this in the thick woods by the Teku at about 4,600 feet elevation. Common on all our hills.

Distribution. Malay Islands from Celebes west to North Burmah, Hainan.

GNETACEÆ.

289. *GNETUM MICROCARPUM*, *Bl.*, var. This occurs in the woods by the Camp and on the Teku. It resembles the var. *sylvestris* of the low country, but the leaves are rather narrower and pointed. I have almost the same form from Mt. Ophir and the top of Penang Hill, and it seems to be a mountain-form. The species is common over the whole Peninsula.

FERNS.

*290. *GLEICHENIA DICARPA*, var. *ALPINA*. Common on Gunong Tahan up to 7,000 feet.

291. *GLEICHENIA NORRISII*, *Mett.*; *Ridl. op. cit.* p. 333. Woods by the Teku River, Gunong Tahan, 4,600 feet altitude. This occurs also in the hills of Perak and Penang.

292. *GLEICHENIA FLAGELLARIS*, *Spr.* Upper part of the Teku stream, base of Gunong Tahan.

Distribution. Polynesia, Malay Islands and Mascarene Isles. Most of the higher mountains of the Peninsula.

*293. *ALSOPHILA KINGII*, *Bedd.*; *Ridl. op. cit.* p. 333. Teku woods and along the Camp stream. Not rare in the woods by the streams.

Distribution. Johore and Perak Mountains.

294. *ALSOPHILA DUBIA*, *Bedd.* Woods of the Teku River at 4,600 feet.

Distribution. Taiping hills.

*295. *MATONIA PECTINATA*, *Br.*; *Ridl. op. cit.* p. 333. Common all over this district from the ridges above Wray's Camp to the Padang streams.

*296. *LECANOPTERIS CARNOSA*, *Bl.*; *Ridl. op. cit.* p. 333. Common on trees on the Padang and ridges from 3,300 to 6,000 feet.

Distribution. Malay Peninsula from Singapore to Perak and islands.

*297. *HYMENOPHYLLUM POLYANTHUM*, Sw., var. *BLUMEANUM*, Ridl. *op. cit.* p. 333. Trees in woods, Padang.

298. *HYMENOPHYLLUM JAVANICUM* (Spring). Trees in woods, Padang.

299. *HYMENOPHYLLUM DENTICULATUM*, Sw. On trees in the woods, Padang.

*300. *TRICHOMANES PALLIDUM*, Bl.; Ridl. *op. cit.* p. 733; *antea*, p. 61. Under rocks, in damp spots, Padang streams and woods.

*301. *TRICHOMANES DIGITATUM*, Sw.; Ridl. *op. cit.* p. 333. Woods on the Padang.

*302. *TRICHOMANES PLUMA*, Hook.; Ridl. *op. cit.* p. 333; *antea*, p. 61. Common under banks and rocks and in woods in damp spots to 5,600 feet.

*303. *TRICHOMANES APIFOLIUM*, Presl; Ridl. *op. cit.* p. 334; *antea*, p. 61. Woods near the Teku.

Distribution. Malay Isles, Polynesia, and Mt. Ophir.

*304. *TRICHOMANES RADICANS*, Sw., var. *KUNZEANUM*, Ridl. *op. cit.* p. 334. Woods near the Teku, Gunong Tahan, 4,600 feet.

305. *TRICHOMANES DENTICULATUM*, Bak. Damp woods, Gunong Tahan.

*306. *HUMATA PEDATA*, Sm.; Ridl. *op. cit.* p. 334. Rocks in the streams at 9th Camp. Ridges below the Gully.

Distribution. Common at all elevations in the Peninsula, Malay Isles, India, Ceylon, and Mascarene Isles.

307. *PROSAPTIA EMERSONII*, Presl; *antea*, p. 61. On trees in the wood behind the Camp.

Distribution. Indo-Malaya.

*308. *LINDSAYA CULTRATA*, Sw.; Ridl. *op. cit.* p. 334. Common on banks, especially at the Camp stream.

*309. *LINDSAYA SCANDENS*, Hook.; Ridl. *op. cit.* p. 334. Woods by the Teku, 4,600 feet altitude.

310. *LINDSAYA ORBICULATA*, Lam. Banks of streams on the Padang.

*311. *LINDSAYA RIGIDA*, Sm.; Ridl. *op. cit.* p. 334. Banks of streams on the Padang.

312. *PTERIS AQUILINA*, L. Only seen close to the Camp houses, near Wray's Camp; Padang Camp, and the top of Gunong Tahan, 7,186 feet altitude.

It was curious that the only plants of the bracken seen were under or actually in contact with the Camp houses.

The form here was usually the softly woolly one usually met with at high altitudes.

*313. *PLAGIOGYRIA EUPHLEBIA*, Kze. Common in woods and on banks of all the streams, often attaining a large size. Collected also by Robinson and Wray in the expedition of

1905; these specimens were rather dwarfed and looked somewhat distinct, but they were obviously not fully developed.

Distribution. India, Japan, Australia, and Perak Mountains.

314. *ASPLENIUM LUNULATUM*, Sw. Teku woods at 4,600 feet.

Distribution. India and Perak.

315. *DIPLAZIUM SPECIOSUM*, Mett. Dense woods by the first Padang stream and Teku woods.

Distribution. Indo-Malaya.

316. *LASTRÆA ARISTATA*, Moore. A clump at the base of rocks in the valley of the first Padang stream. This has quite the habit of a *Davallia* with a long ferruginous hairy rhizome. It much resembles a specimen from Mt. Matang, Borneo.

New to the Peninsula.

*317. *DIPTERIS HORSFIELDII*, Br.; Ridl. *op. cit.* p. 334. Abundant on the ridges between Wray's Camp and the Padang. Common also in woods and on stream-banks on the Padang to 5,600 feet.

Distribution. Common at high altitudes and on the sea-coasts in the Peninsula, also the Malay Islands and Polynesia.

318. *DIPTERIS LOBBIANA*, Hook. In dense masses by the Tahan River and also at the mouth of the Camp stream where it joins the Teku.

Distribution. Hills of the Peninsula and Borneo.

319. *DIPTERIS QUINQUE-FURCATA*, Christ. On rocky and sandy banks of the Teku near the mouth of the Camp stream, local, a single patch. New to the Peninsula, native of Borneo.

I have only seen the description of this striking fern in the 'Ferns of Malaya' by Christ.

It had a stout rhizome, $\frac{1}{2}$ inch through, covered with a dense coat of closest black subulate hairs; stems over two feet tall, glabrous, except at the base, more than $\frac{1}{2}$ inch through; lamina 6 inches long and wider, coriaceous, bifurcating thrice, cuneate at the base; ultimate segments linear, acuminate, subacute; main nerves forming square areolæ; the reticulations less conspicuous. Sori circular, 1 to 5 in the centre of an areolus. The sori are fewer than in the original description, but otherwise the description fits this plant well.

320. *LASTRÆA VISCOLA*, Bl. Common in the Gully and damp peaty spots just below Bukit Bandera (*L. Ridleyi*, Christ MSS.)

Distribution. Mt. Ophir, Tahan River, Selangor and Perak Hills.

*321. *OLEANDRA NERIIFORMIS*, Cav.; Ridl. *op. cit.* p. 334. Common on the ridges above Wray's Camp.

322. *POLYPODIUM HIRTELLUM*, Bl. A large form on trees in woods, Padang.

Distribution. Mt. Ophir, Perak Hills, Ceylon, and Malay Islands.

323. *POLYPODIUM PARASITICUM*, *Mett.* Rare on trees near the Camp stream.

Distribution. Mt. Ophir, Penang Hill, and India.

*324. *POLYPODIUM CUCULLATUM*, *Nees*; *Ridl. op. cit.* p. 334. Common on trees in the Padang Woods.

Distribution. Mt. Ophir, Kluang Terbang, Pahang, Selangor, and Perak Hills, also Ceylon.

*325. *POLYPODIUM STREPTOPHYLLUM*, *Bak.*; *Ridl. op. cit.* Common on trees and rocks, Padang.

Distribution. Malay Peninsula.

326. *POLYPODIUM MALACCANUM*, *Bak.* Woods on the Padang.

Distribution. Mt. Ophir.

327. *POLYPODIUM SUBPINNATIFIDUM*, *Bl.* Woods near the Padang.

This form I have also collected on the Semangkok Pass. It was first identified by Dr. Christ as *P. trichomanoides*, a species which, however, does not occur here.

*328. *PLEOPELTIS WRAYI*, *Bak.*; *Ridl. op. cit.* p. 334. On trees on ridges near Bukit Bandera.

Distribution. Pahang and Perak Hills.

*329. *PLEOPELTIS STENOPHYLLA*, *Bl.*; *Ridl. op. cit.* p. 334. A very narrow form.

Trees on the ridges below the Gully. Common in our Hills.

330. *PLEOPELTIS INCURVATA*, *Bl.* Open woods on the Padang.

Distribution. Mountains of Selangor and Perak, also Malay islands.

*331. *PLEOPELTIS LACINIATA*, *Bl.* Terrestrial open woods near the 9th Camp.

Distribution. Perak Hills.

*332. *VITTARIA FALCATA*, *Kze.*; *Ridl. op. cit.* p. 334. Common on trees in the Padang woods.

Distribution. Mountains of Selangor, Malacca, and Perak.

333. *ELAPHOGLOSSUM DECURRENS*, *Bl.* Terrestrial, in deep moss in woods on the Camp stream, local. New to the Peninsula.

*334. *ELAPHOGLOSSUM LAURIFOLIUM*, *Bedd.* On trees above the Gully. Also obtained by Robinson in 1905.

335. *POLYBOTRYA APPENDICULATA*, var. *SUBINTEGRA*, *Web.* Woods by streams on the Padang. Form with the leaf-margins quite entire.

336. *CHRYSODIUM BICUSPE*, *Hook.*; *antea.* p. 62. Under and on dry rocks, by the Camp stream, and by the upper part of the Teku.

Distribution. Mt. Ophir, Taiping Hills, Java, and Formosa.

*337. *SCHIZÆA MALACCANA*, Bak.; *Ridl. op. cit.* p. 335. Very common on rocks in woods, or on stream-banks all over the district; a rather short thick form.

Distribution. Mt. Ophir, Kedah Peak, and Malay Peninsula generally.

LYCOPODIACEÆ.

338. *LYCOPODIUM CERNUUM*, L. A very curious, stiffly rigid form occurs on the dry parts of the Padang.

*339. *LYCOPODIUM CASUARINOIDES*, *Spring.*; *Antea* p. 62. Common in the woods and occasionally creeping over rocks from 4,000 feet to 5,600.

340. *LYCOPODIUM CEYLANICUM*, *Spring.* On stream-banks by the Teku and in other spots, attaining the height of a foot and branched.

341. *LYCOPODIUM REFLEXUM*, *Lam.* Banks of Teku stream at 4,600 feet elevation in wooded spots.

342. *LYCOPODIUM CAROLINIANUM*, L. Common on damp spots on the open Padang, with bright green creeping stems, sending up fruiting shoots as much as 6 inches tall. The plant exactly resembles a specimen from Missouri, North America, collected by Tracy, in the Singapore herbarium. New to the Peninsula.

Distribution. Africa, Ceylon, New Guinea, China, N. and S. America.

343. *SELAGINELLA SUBEROSA*, *Spring.* In the Teku woods.

344. *SELAGINELLA PINANGENSIS*, *Spring.* Banks of streams near the Camp.

345. *SELAGINELLA OLIGOSTACHYA*, Bak. Gunong Tahan (*Robinson.*)

346. *SELAGINELLA ALUTACEA*, *Spring.* Teku woods on damp banks.

347. *SELAGINELLA ACUTANGULA*, *Spring.* Woods, Gunong Tahan.

348. *SELAGINELLA POLITA*, n. sp.

Stem ascending, 6 to 8 inches, nude, rough with persistent leaf-bases, pale yellow; branches about 4 inches long, little-branched, suberect. Leaves of the main stem oblong-lanceolate, apex rounded, spaced, deciduous; of lower plane lanceolate to ovate-lanceolate, base broad, apex rounded, imbricate, texture firm, polished, dark green above, a little paler beneath, leaves of upper plane half as long, lanceolate, long-cuspidate, paler. Spikes $\frac{1}{2}$ to 1 inch long, slender. Bracts of lower plane triangular, acute, small, and pale; of upper plane subtriangular, quite obtuse, dark green. Sporangia large, globose.

Woods by the Teku, Gunong Tahan.

Nearest to *S. suberosa*, but smaller and denser, and little-branched; leaves rigid, polished and not ciliate. The habit of the plant is more that of *S. trichobasis*.

XIV. SOME NOTES ON ABORIGINAL TRIBES OF UPPER PERAK. (Plates XXXI—XXXIV).

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The following observations were made among three aboriginal tribes during an expedition to Upper Perak in March and April of 1915. The tribes visited were the Semang of Grik, the Orang Jehehr of Temengoh, and the Hill Sakai of the main range, the particular sections of the last-named tribe met with living close to the bridle path which runs from Temengoh to Lasah in Ulu Plus. I here deal with each tribe separately and in the order given above.

THE NEGRITOS OF GRIK. (Plate XXXI, Fig. 1).

The Negritos of Grik appear to be absolutely similar to those of Lenggon, whom I have already described in a former number of this Journal.* I purpose therefore to say but little about them here, with the exception of setting down any information which I did not obtain at Lenggon. It has, I think, been customary to look upon the Negritos or Semang of Grik as being of purer race than those of Lenggon, and, indeed, in the article on the Lenggon tribe I myself spoke of "the pure Semang of Grik†." The Grik people told me that some of them are related to individuals of the Lenggon, Gelok, and Kuala Kenering communities, but I gathered they do not hold very much intercourse with them. The Malays call these small bands of Semang from Lenggon to and beyond Grik, *Sakai Jeram*. They speak a Sakai, i.e., non-Semang dialect, and are of fairly pure Negrito stock.

In my former paper on the Semang of Lenggon I stated, on evidence obtained from the Negritos of Ijok,‡ that the Lenggon tribe called themselves *Semark Blum*. This information is perfectly correct, but I find (from what I learnt at Grik) that the translation of the name which I gave, i.e. men of the big (water), is not. *Semark* in the first place does not appear to mean men in general (homines), but is used in reference to the aborigines only; secondly, *Ong Blum*, which I translated "big water," is as far as I can make out the aboriginal name for the Perak river, which presumably rises not far from the Blum district in Upper Perak. *Ong Blum*, therefore, means the Blum River (or water), and *Semark Blum*, the aborigines of the Blum. Of course the Perak river is to them the big river (or water), hence, I imagine, the mistake.¶ The

* Journal F.M.S. Museums Vol. V, No. 2, 1914.

† I had not then visited them.

‡ See also "Notes on the aboriginal inhabitants of Ijok," Journal F.M.S. Museums, Vol. V, No. 4.

¶ "The big Perak river" would, they said, be "*Ong Blum chekah*."

Grik Semang gave me to understand that the word which they used for people in general (homines) was *Gob* and the following examples showing its use.

Gob Semark.—One of themselves: i.e. a Negrito.

Gob Peletau.—A white man.

Semark Plek (or *Pleh*), however, is the name given to the Hill Sakai, so, as I have stated above, *Semark* in their dialect means any kind of aboriginal. A rather curious point is that the word *Gop* or *Gob* seems to be used among some tribes of aborigines to denote the Malays only, for instance the Sakai of Sungkai call the Malays *Gob* or *Mai Gob*, the word they use for men (homines) being *Mai*.

The Semang of Grik, like the Jehehr, whose custom in this respect I describe below, use the blood-throwing ceremony when frightened by a thunderstorm, and say to the thunder spirit "*Dayah hog di baling*." This they told me means "Take up the blood," but, if *baling* has the same meaning as in Malay, I should guess that a more correct translation would be, "Take up the blood that we throw you." Children are forbidden to play about in the water, as it is supposed that this would cause a thunderstorm.

At burials the Semang say to the spirit of the deceased "*Du! Du! Yak!*" which they told me means "Go! Go! Hear!" i.e. "Go your way! Hear our command!"

THE ORANG JEHEHR OF TEMENGOH.

(Pl. XXXI Fig. 2, Pl. XXXII Fig. 1.)

This tribe, which speaks a Semang dialect, appears to be of fairly pure Negrito blood. The hair of many individuals, though not all, is typically woolly, and, with one exception, the skin colour in all that I met, was extremely dark. The type of features, however, varied to some extent, as did the character of the hair, and while it was easy to pick out individuals who in both respects were typically negritic, mixed types were observable, some of whom had straight or wavy hair, and other features which were decidedly not Negrito, but Sakai. As on first acquaintance, and also to a less extent later, they were inclined to be rather nervous, I thought it better not to attempt to take any physical measurements, a performance which was likely to be regarded with considerable suspicion. A fair number of ethnographical specimens were purchased for the Perak Museum; and for the smaller articles, silver ten cent pieces were in great demand. In the matter of money the Jehehr are still very unsophisticated, and when I had to pay more than a dollar for specimens, I had the greatest difficulty in getting them to accept notes, their constant request being for silver dollars, as they said that they did not want, or understand, "tree leaves." One man to whom I paid two dollars in ten cent. pieces was quite uncertain how many he ought to receive. Needless to say, the local Malays

frequently take advantage of the Jehehr's guilelessness. Among the Jehehr, as among other Negrito tribes of the western, and I believe, most of those on the eastern side of the Peninsula, the hair of both sexes was cut short or the head shaved, but in many cases a small top-knot was left, which they adorned with sweet-smelling leaves or other ornaments.

Annandale places the Jehehr in the Sakai section of his notes on the aborigines of Upper Perak* though he himself says: "The first two tribes to be dealt with under the heading† are so closely related to the Semang stock, that the wisdom of separating them from it may be doubted. It is hardly controversial to state that they are Semangs with a slight admixture of either Malay or Sakai blood, supposing that it is legitimate to speak of a definite Sakai *race*, which is very doubtful at the present stage of our enquiry. Still, it has seemed better to make the division, seeing that the differences, though inconspicuous, most certainly exist, and that the tribes of Upper Perak, other than Séman‡, include persons among their numbers whose hair is nearly straight and whose complexion is very much paler than chocolate."

There is certainly truth in these observations, still, if we take into consideration the three characters of hair, skin colour, and features, the Jehehr are, according to my mind, very distinctly Negrito. It is but seldom that an individual can be found (I can only remember one) in whom two out of the three characters are not negritic, and, though there is no doubt some slight admixture of foreign blood in the tribe, probably few people, if they were shown a group of Jehehr, would hesitate in saying that they were Negritos. Furthermore, though language is in itself admittedly not a fair criterion of race, yet the Jehehr *do* speak a "Semang dialect;" (i.e. one in which the words given by Skeat as distinctive of Semang dialects occur). Now, though instances of Negrito tribes speaking Sakai dialects are well known (e.g. the tribes of Grik and Lenggong) I do not ever remember having heard of a case in which a Semang dialect had imposed itself upon a Sakai tribe.

An account of the dress and ornaments worn by the Jehehr has already been given by Annandale¶, and to this I can add very little fresh information. One man seen was wearing rather a curious crown-like head-dress made of strips of pandanus leaf, coloured yellow, interwoven with *akar* or *urat batu*. The nasal septum was pierced in the majority of the men, the operation being, the Jehehr told me, performed with a porcupine quill, porcupine quills being also frequently worn through the hole as an ornament. Annandale mentions that the young shoots of some zingiberaceous plant were used

* Fasciculi Malayenses, Anthropology p. 22.

† The Jehehr is one of the two.

‡ Skeat's Pagan Races, Vol. 11, page 390.

¶ Fasciculi Malayenses, Anthropology p. 27.

for the same purpose, but I did not notice this. Tattooing was observed on one man and one woman, but I do not think that the practice is truly native to the Jehehr, and in the case of the man he told me that it had been done by Hill Sakai, among whom as I shall point out later, I found a very large percentage of individuals with tattoo marks. The tattoo patterns on the woman consisted of two parallel and vertical lines running from the top of the forehead to the tip of the nose, those on the man of two similar lines from the top of the forehead, but terminating on the level of the eyebrows. The chief weapons in use among the Jehehr are blow-pipes, bows and arrows, and spears. Skeat has described very fully various bows, arrows, and quivers from Upper Perak,* so I do not propose to enter into these matters at any great length here; but I will record shortly a few points worth mentioning concerning them, under the section of this paper which deals with the Sakai of the hill district, since the bows and arrows purchased from these people were identical with those obtained from the Jehehr, with the single exception that the Jehehr quivers were quite plain, while those of the hill people were decorated with patterns.

Annandale states that the Jehehr make neither bows and arrows nor blow pipes, but obtain these articles from the Hill tribes, yet the Jehehr told me that they made both, and were capable of hammering out scrap iron into arrow-heads. I did not, however, see any forges in the Jehehr's camps as I did among the Hill Sakai. With regard to the blow-pipes purchased from the Jehehr, out of four specimens, three have an apple-shaped mouth-piece of *damar kelulut*, the remaining example a wooden mouth-piece of the same shape; otherwise they are similar to those of the Hill Sakai which I describe below. The same thing holds good for the quivers for blow-pipe darts, except in one case where I obtained a specimen of the true Negrito type of dart quiver, i.e., a coverless receptacle consisting simply of an internode of bamboo with a node left at one end to form its bottom. This quiver was ornamented with rudely scratched-in patterns. Sometimes numerous strips of rattan leaf are put into the quivers with the idea of keeping the darts apart. In no case that I saw were the dart-stems notched above the poison, in order that the point might break off in the wound, when an animal was struck.

Two Jehehr settlements were visited, one of which, on a hill above Kampong Temengoh, was a single tree-dwelling. This was a hut supported on eight small trees, with the floor about fifteen feet above ground-level. Small trees growing together in the most advantageous manner possible had been selected to support the dwelling, and the house was built among their slender trunks much as a bird's nest is built between the twigs of a branch. Access to the hut was obtained by a ladder of several saplings placed side by side. Near Jeram Subang

* Pagan Races, Vol. I p. 270-278.

on the Temengoh River, and some five or six miles below Temengoh village, I paid a visit to a shelter, or rather assemblage of shelters, which was much more typically Negrito. This camp consisted of eight screens of attaps placed roughly in a circle, and arranged so that the "roofs" nearly met in the centre, while enclosed within the circle were the boles of two fairly large trees. One or more bamboo sleeping-platforms was to be seen under every shelter, and a fire, at which the Jehehr not only cook their food, but warm themselves at night, was smouldering close to each platform. This type of habitation was exactly similar to those I had seen on a former occasion among the Semang of Lenggong.

In reaching the settlement just described, I had to pass through two clearings of considerable size. The first of these was deserted, but the second, although the padi crop had been reaped, still afforded the Jehehr some bananas, some brinjals and other vegetables. In this second clearing was a small watcher's hut, built in a commanding position, and raised on very high posts. On one side of the clearing and not far from the jungle, was a house built on posts in the usual Malay (or Sakai) fashion, but this had been abandoned, after the harvest, in favour of the ground shelters already described, which were in the jungle.

As far as I could gather, the Jehehr have practically no religious beliefs. Souls after death, according to their statement, went to dwell by the edge of the sea, and they seem to be afraid that the spirits of the dead may linger near the huts of their relatives and trouble them, since they told me, that when a corpse is being buried they say "*Bai! Dun! Dun! Dun! Di-prak!*" which they said meant "Dig! Leave! Go!" I was also told that offerings of food were placed on the graves. Two kinds of grave-ghosts, not, it seems, spirits of the dead, are much feared, these being named *Kemoid* and *Sara*. I could obtain no evidence that there was any belief in a Supreme Being, though the Jehehr, are certainly, exceedingly afraid of thunder (*kare*), as are most of the aboriginal tribes, but though thunder, according to Vaughan Stevens, is the Semang supreme god I could find nothing to show that it was so regarded by the Jehehr, yet it is certainly thought to be caused by a powerful spirit, who may be appeased by an offering of blood.

The Jehehr said, that when a thunderstorm came on, they cut the outside of the calf of the right leg near the shin-bone with a knife, and taking a few drops of blood from the wound on the knife blade, and putting them into the palm of the left hand, threw them up into the air saying, "*Haroid! Saidth!*" (Throw it away! Sleep! (?)). Various actions are tabu, as they are supposed to bring on thunderstorms, which may involve the death by lightning (*chilou*) of others, as well as of the transgressor. For instance it is tabu for anyone to kill a millipede, to shoot an owl with blow-pipe, or to flash a

looking-glass or other shining object about in the open, and for the same reason it is tabu for a man to have intercourse with his wife during daytime.

An attempt is sometimes made to drive away a threatening storm by blowing through the teeth with a hissing sound—"Hish." The ideas of the Jehehr with regard to the lunar eclipse, which they call *Kenod bulan* are similar to those of the Semang of Ijok. They believe that the moon is attacked by a butterfly which attempts to swallow it. The Jehehr frighten away the butterfly by making music with bamboo stampers.

It is curious to note that among most, if not all, the aboriginal tribes of the Peninsula the spells of the magician are performed within a magic circle. In some cases a round hut of leaves is erected in which the magician ensconces himself, in others merely a round frame with hangings is used. The Jehehr told me that they too made use of the round hut or *bumbun*.

The custom of avoidance of the mother-in-law seems to be very strictly in force, since she may neither be named, or spoken to, by her son-in-law.

Some articles of diet are tabu to the women, it being considered that the infringement of the tabu would cause the offender to suffer from convulsions (*sawan*). The flesh of the *plandok* or chevrotain is rigidly tabued, but though, to a lesser extent, the meat of the sambhur (*Cervus unicolor*) and the muntjac (*Muntiacus muntjac*) are also tabu I was told that some women were not afraid to eat it. It looks rather as if these tabus might have arisen from the desire of the men to reserve the rarer and most savoury items of diet to themselves.

As far as I could gather, there appears to be little or no marriage ceremony. The Jehehr said that it was allowable to have two wives, but not usual.

A man who wishes to marry takes a wife from another settlement (the girls of marriageable age in his own will probably be all his near relations) and brings her back to his own camp. After a while, however, he returns to live with his wife's relatives for a time, and visits are paid to them at varying intervals.

A woman is forbidden to eat certain articles of food for four days after giving birth to a child,; these are the cabbages of palms, flesh and fish, and tubers.

Names of children are usually taken from the river, or small streams, nearest to which they are born, or from rapids or promontories, but they are also given from the kind of tree under which the birth takes place. The following list of Jehehr names is, I think, fairly representative.

Name.

Chermin derived from *Sungei Chermin*, the Chermin River.

Lek	"	"	<i>Chegar Lek</i> , Lek rapid.
Rambai	"	"	<i>Tanjong Rambai</i> , Rambai Tree Point.
Kunyet	"	"	<i>Pokok Kunyet</i> , Turmeric.
Langsat	"	"	<i>Pohun Langsat</i> , The Langsat Tree.
Eseng	"	"	<i>Sungei Eseng</i> , The Eseng River.
Kepah	"	"	<i>Sungei Kepah</i> , The Kepah River.
Chuit	"	"	<i>Sungei Chuit</i> , The Chuit River.
Ka'un	"	"	<i>Sungei Ka'un</i> , The Ka'un River.
Darah	"	"	<i>Jeram Darah</i> , A Large Rapid in the Temengoh River.
Lanah	"	"	<i>Tanah Lanah</i> , A piece of land called Lanah.

The so called rivers in the above list are, I believe, in most, if not all cases, quite inconsiderable streams, and I have been unable to trace them on the map. The aboriginal tribes of the Peninsula have names for even the tiniest streamlets.

THE HILL-SAKAI (Pls. XXXII—XXXIV.)

The Hill-Sakai, seemingly the same as the Po-Klo of Messrs. Annandale and Robinson although I did not get this name for them—occupy, according to their own accounts, the slopes of the main range, both on the Western and Eastern sides. One of their headmen told me that the extreme boundary of their tribe northwards along the range was the Pergau, a tributary of the Kelantan River. "Beyond this," he said, "live the Orang Sabun," but his description of these people was so hazy that I was unable to obtain any idea as to whether they were Negritos or Sakais. The Kinta River was stated by the same man, to be the southern boundary of the tribe, while locally, in the neighbourhood of Temengoh, the dividing line between the territories of the Jehehr and the hill people is, a Malay told me, a river which he called the Keronang, but which I take to be the stream given on the map as the Kerunai, since it is in about the right position. The Jehehr call the Hill-Sakai, who are known to the Malays as Sakai Bukit, *Mendrak Plek* (or *pleh*), but the only thing I could get from the hill people as a tribal name was *Senoi*, and *Senoi* appears to be simply their word for *people* (homines). The Sakai of the Sungkai district also use the word *Senoi* as tribal designation, but if they wish to speak of a white man, a Pahang Sakai etc., they say *Mai puteh*, a white man; *Mai Pahang*, a Pahang Sakai; *Mai Gop*, a Malay. Presuming, as I have already done, that the Hill Sakai whom I met are the same as Annandale's Po-Klo, no doubt he is perfectly right in classing them as Sakai though he seems uncertain whether he should do so, and not as Negritos. He says, however, in speaking of fifteen men who came to Temengoh during his

visit, who were the only members of the tribe he met, that "while the majority of these individuals only differed from the *Semang of Grik in that they were taller and stouter and did not suffer from skin disease, a few were very considerably paler in complexion, had hair which was straight, and faces of a much less infantile type. Indeed extremes in both directions existed." The photographs given in the Fasciculi certainly show some Negrito types, but as I met, I should judge, about a hundred of the hill people, I had, apart from the fact that I did not take any measurements, a better opportunity of examining these Sakai than Annandale had. Just as, on sight, I should unhesitatingly class the Jehehr as Negritos, so I should place the Orang Bukit among the Sakai. Not that I would for a minute deny that they have a considerable admixture of Negrito blood, for such is obviously the case, as is shown by the occurrence of Negrito facial characters, woolly hair, and dark skins in individuals; but the sum total of the obvious physical characteristics of a large number of the tribe would make me set them down immediately as being much more of the Sakai than Negrito type. Of the Negrito characters which occur, I should say that hair with a tendency to ulotrichy and childish facial appearance were commoner than dark skin colour. As a tribe, however, these people are distinguished as Sakai by comparatively light skin colour, taller stature than that of the Negritos, more regular features, and hair often straight or wavy.

The Hill Sakai, though it might hardly be expected of them, since they live at a distance from Malay villages, are really a good deal more sophisticated than the Jehehr. In the first place I believe that their wits are sharper than those of the Jehehr, and that they have far greater capabilities for adapting themselves to new circumstances. Secondly, the Jehehr, a lazy tribe, hang around the few Malay villages in their neighbourhood and seldom think of going further afield. The Hill Sakai, on the other hand, travel considerable distances, and of those I met, some, and especially the two headmen, were accustomed to visit Sungei Siput and Kuala Kangsar, where they sold rattans gathered in the jungle. Notes were taken in payment for articles bought without the same hesitation that was shown by the Jehehr, and if all the members of the tribe could not tell the difference between a one dollar and a five dollar note, the headmen at any rate could do so, and assured them that they were not being cheated. These two headmen, Toh Raja and Toh Stia, were extremely pleasant and well mannered young men and seemed to possess a very considerable influence over their followers. The latter, as compared with other aboriginal tribes were very independent in their manners and bearing, and were not at all inclined to be ordered about by the Malays, or imposed upon by their brag and bluster. One of my "gembalas†"

* Fasciculi Malayenses, Anthropology. p. 23.

† Elephant drivers.

ordered a Sakai to fetch him some water, and the Sakai, much to the surprise of the Malay turned round and told him that if he wanted water he had better go and get it himself. Several cases are known of the Hill Sakai of this region objecting to the presence of strangers in their territories and ejecting them.

Tattooing, called by the Sakai *chenul*, was observed on the faces of a number of individuals, both on men and women. In no case did I see tattoo marks on any other part of the body. Since, though tattooing has been recorded among the Sakai by various observers, there seems to be some doubt in Skeat's mind as to how far evidence with regard to tattooing was to be believed, I will state here—I have already done so in other cases where I have met with the practice—that in speaking of tattooing I invariably mean tattooing proper, i.e., pricking colouring material into the skin by means of a pointed instrument. Skeat sums up the evidence with regard to tattooing, available at the time he wrote, as follows:

“In spite of this apparently strong consensus of evidence, I must still repeat the warning that (although there is clearly some form of real tattooing, i.e., skin-puncturation, practised in the Peninsula), yet what many of the observers from whom I have quoted, are wont to call tattooing, is certainly no more than sacrifice* or even perhaps nothing but mere face-paint after all.”†

The Sakai told me that the operation was performed with a bertam thorn and soot or charcoal. The resulting patterns were generally rather faint, not very much pigment having been forced in under the skin. In the men the most usual tattoo marks found were three pairs of parallel lines on either side of the face, the topmost line usually running slanting across the face from near the top of the ear to the nostril, the lowest from rather below the ear to the corner of the mouth. In one case a man, besides having this arrangement of tattoo markings, was also ornamented with two parallel lines from the top of the forehead in the centre, to the root of the nose.

In the women the tattoo patterns were generally confined to the forehead, one of the commonest forms being, roughly, a reversed broad arrow composed of three pairs of parallel lines, the centre pair reaching from the top of the forehead to just above the root of the nose, the other two pairs from the top of the forehead to above the eyebrows. One man, in addition to the ordinary cheek pattern, had also this type of forehead design, but the two lines forming the shaft of the arrow were prolonged to the tip of the nose. Several women, whom I saw, had the face stained yellow with some vegetable colouring matter resembling turmeric, which, they said, they obtained from a fairly tall shrub.

The custom of boring a hole in the septum of the nose was common, but not universal: porcupine quills were worn

* I have never yet seen scarification employed.

† Pagan Races: Vol. 2, p. 43.

thrust through the hole. Both men and women among the Hill Sakai wear their hair short, but the latter grow a small tuft at the back of the head like the women of the Semang tribes.

It is not necessary to say very much regarding the dress of the tribe. Malay pattern sarongs or T bandages of European cloth were the usual costume of the men, while most of the women wore short sarongs of red twill which reached from the waist to a little below the knees. Necklaces of beads were in favour among the women, and, to a less extent, among the men, the women's necklaces being long loops reaching to the waist, while the mens' consisted of a string of beads tied tightly round the neck with the long ends hanging down in front. Head-fillets of twisted vegetable fibre were commonly worn by the men. The bamboo combs used by the women were generally decorated with scratched-in patterns, but in one specimen that I saw the outer skin of the bamboo had been partly removed after the Semang fashion. I secured one very pretty little comb which was 10.2 cms. in length, but had a breadth of only 1.7 cms. both the top and the teeth, of which there were seven, being covered with neatly etched patterns. Other objects of dress which I obtained, were a couple of necklaces, one of small, white seeds, the other of white and black seeds strung alternately, and a crown-like headdress of green and yellow leaves similar in construction to a specimen which I bought from the Jehehr.

Before speaking of the agriculture of the tribe I will give a short description of the only type of house seen. On the journey from Temengoh along the Lasah bridle path Sakai were first met with at Kuala Jinaheng (Jermahing) where we camped out for the night. Their house was not visited, since it was some distance away, and was stated to be only a temporary abode, while I was anxious to push on the next morning to another settlement, said to consist of a single communal house. This house, about which I found the information received to be perfectly correct, was situated on a rising ground near a small stream, and was surrounded by a very considerable clearing. We also passed a similar type of dwelling on a hill above the bridle path after leaving Kuala Jinaheng, but it was newly built, and the Sakai had not yet moved into it from their old clearing, which was a long way off. The communal house, near which I camped for the night, (Pl. XXXIII Fig. 1) was raised on posts to a minimum height of ten feet from the ground; its length was forty-nine, and its breadth nineteen feet. Entry was obtained by a main ladder at one end of the house and a couple of subsidiary ladders against the side walls at the other end of the building. These ladders were constructed of a number of large bamboos or small tree-trunks placed side by side with steps of bamboo or wood lashed across them. A very large amount of bamboo was used in the construction of the dwelling, the rafters,

floor stringers, and many of the supplementary posts were all of bamboo, and sheet bamboo was used for the floors, walling, and for covering the bamboo sleeping benches or platforms. The height between floor and the cross beams (about four feet) was so little that in walking about it was constantly necessary to dodge under timberings. Most of the sleeping platforms were arranged along the walls, but some jutted out at right angles. There was, however, sufficient room left to allow passage from one end of the house to the other. The dwelling contained four earth hearths, these being built close to the sleeping platforms. As far as I could find out, there were no very definitely allotted sleeping places, but the unmarried of either sex were kept apart. The Hill Sakai are hard workers, and, for an aboriginal tribe very good agriculturists. Each community has several large clearings planted with different crops, but padi does not seem to be grown on the Perak side of the main range. The headman of the village at which I stopped told me that his people had four clearings in use at the time of my visit, one planted with *sengkuai* (millet), two with *ubi kayu* (tapioca) and one with a mixed crop of *kaladi* (caladium) and *keledak* (*Convolvulus batatas*). It appears that the work of clearing and planting is performed by the whole of the settlement in common, and the crops are also common property.

I had imagined, chiefly owing to the size of the house I saw, that the Sakai would probably only have watching huts on the other clearings, and would go to and return from them the same day; hence I omitted to ask them whether they had any kind of dwellings on them, but after my return to Temengoh, the Malay *Gembala Sakai*,* Pak Lebai Ishak, informed me that they usually had a large communal house in each clearing and the whole community moved from one abode to another whenever there was any necessity for doing so.

The tribe plants a fair amount of tobacco, for though I did not come across any growing I saw a considerable quantity, cut into shreds, drying on rectangular frames made of loosely plaited strips of *bemban*. These were placed on the low cross beams above the fire places. The Sakai told me that the tobacco was generally smoked as soon as dry, but occasionally they stored it in joints of bamboo to mature.

With regard to weapons, blow-pipes were of the usual Upper Perak type, i.e. weapons with a one-piece outer tube consisting of a single internode. The mouth pieces, which were of wood, were oblately spheroidal. The outer tube was never sufficiently long to enclose the whole of the inner, which is of course the important part of the blow-pipe, the reason probably being that bamboos of sufficient size and with internodes long enough for the purpose could not be obtained. To get over this difficulty a cylindrical piece of

* Herdsman of the Sakai, a name frequently given to any Malay who has gained authority over the aborigines.

bamboo is pushed over the inner tube just above the mouth-piece. This may be either larger or smaller than the outer tube. If the former is the case, the end of the outer tube is somewhat pared away and the short section fitted over it; if the latter, the end of it is fitted into the outer tube. The only attempts at ornamentation on the blow-pipes externally were annular scratched-in markings below the muzzles and occasionally some slight patterns on the extra bamboo section next the mouth-piece. The dart quivers were all of the usual type of *covered* quiver obtained from Upper Perak, and the Piah and Plus valleys. The main type of decoration is said by Annandale to be derived from the tail of the Argus pheasant, but, as I found that I was given several names for each kind of pattern,—the Argus pheasant was not one obtained,—I ceased making further enquiries. I also took pattern names among the Jehehr with very similar results.

Descriptions of several specimens of bows from Upper Perak having been given by Skeat, I do not think that I can add anything very material to what has already been recorded, but I set down here a few noticeable features with regard to them, and their arrows and quivers. The bows which were of some kind of palm wood, *ibul* or *menhar* (unidentified) were furnished with shoulders at top and bottom. The permanently attached end of the cord was fastened with a knot at one pair of shoulders. The other end was furnished with a loop, which, when the bow was strung, was fitted over the shoulders at the other extremity, and when loose was allowed to slip down the wood. The outer faces of the bows were rounded, but the inner, though somewhat flattened, always had a ridge running down the middle from end to end. The bow is bent for stringing by placing the end at which the cord is fixed on the ground, grasping the other end in the hands and pressing with the knee of the right leg, the wood of the bow being gripped near the ground between the big and second toes.

None of the arrows I saw had detachable foreshafts, as had some described by Mr. Wray. The blades of the arrow-heads were broadly lanceolate, or spatulate, in shape, and furnished with either one or two barbs at their base. A stem of at least 5.5. cms in length, often considerably more, projected from the base of the blade and the end of this was lashed into the bamboo arrow-shaft with a rattan binding, but more than two-thirds of it were left protruding. The notch for the cord across the top of the shaft was in the same plane as the flattened arrow-head, as was also the feathering. This consisted of two long and narrow strips of the tail feathers of a hornbill, fixed to the shaft at their ends with slight bindings covered over with *damar kelulut*, but free along the rest of their length. The part of the shaft to which the feathers were attached was ornamented with incised annular markings. In some arrows these markings extended beyond the lower point of attachment of the feathers. The quivers were made, as is usual, from an internode of bamboo with a node to form the

bottom of the receptacle, a piece of the next internode, sharpened to a spike for planting the quiver in the ground, being left adhering to the node. The arrows were prevented from rattling in the quiver, or from falling out by a plug of leaves pushed down into its mouth between the arrow-shafts, which projected from it to the extent of rather less than half their length. Both the quivers made by the Hill Sakai, which I obtained, were partially ornamented with scratched-in patterns, but one had some of the patterns made more prominent by removing portions of the outer skin of the bamboo and rubbing in brown colouring matter, after the manner of the Negrito tribes.

The Hill Sakai, as I have already stated, have some little skill in forging iron. Outside the communal house there was standing a small thatched shelter, and under this was a Sakai blacksmith's forge. The anvil, or anvils, on which the iron was hammered out were a couple of small boulders with rather concave faces; and the hammer used was an iron spike with a flattened head, hafted to a short handle after the fashion of a native adze (*beliong*). The bellows or apparatus for blowing up the fire consisted of a couple of vertical bamboo cylinders, from the open tops of which projected two slight wooden piston rods. The piston-heads were made by binding a mass of feathers to the end of each rod. The cylinders were lashed to a stake driven into the ground, and further steadied by spikes of bamboo projecting into the ground from the node which formed the base of each. The air was delivered from the cylinders to the hearth by two bamboo tubes issuing from their base. The apparatus was exactly similar to one in the Perak Museum collected by Mr. L. Wray in the Piah Valley, and is of a type found throughout the Indo-Malayan region. Two or three half-completed spear-heads, which had cracked in forging and had been thrown aside as useless, were lying about near the forge. Iron for making spear and arrow-heads is, of course, obtained from Chinese or Malay traders. Fish-spear heads are also made by Sakai blacksmiths and one kind of which I purchased a specimen, deserves description in detail. This implement, 18 cms. in length, was composed of four fine bars or strips of iron, bound together at the "tang," or end which is inserted into the shaft, with a strip of rattan-cane. This "tang" is exceedingly clumsy and measures as much as 2.5 cms. in breadth below the base of the blade proper, but tapers towards its other end owing to the fining out of the iron bars of which it is composed. In the blade the two outer strips are bent at the base so as to separate them from those in the centre: the latter are slightly bent apart at their tips. The spear-head looks a very inefficient implement, but in spite of this, I saw fish each of about three pounds weight, which had been obtained with fish-spears of this type. Barbed fish-spears like those of the Malays (*serampang*) were also used, and the Sakai told me that these too were of their own manufacture.

The time spent with the "Sakai Bukit" being very short,—one night at Kuala Jinaheng on the way out, a night and parts of two days at the communal house, and another night at Kuala Jinaheng on the return journey,—I naturally could not gather a great deal of information with regard to their inner life; such details, however, as I was able to obtain are set down below.

I could get no evidence that there was any belief in a Supreme Being, that they had any legend of the creation of the world, or of an existence after death. One Sakai, when asked what happened to the souls of the dead, replied that he did not know, but anyhow the body just went rotten.

As among the Sakai of the Batang Padang District of Perak, the shamans of the tribe are termed *Halak*, and the shaman's familiar spirit is called his *Anak Yang*.

Like the Jehehr, and other aboriginal tribes, both Negrito and Sakai, the hill people appear to be very much afraid of thunder and lightning.

It appears, that, as is also the custom of the Sakai of the Ulu Sungkai, should a child have been teasing, or playing with a cat or a dog, and a thunderstorm come on shortly afterwards, the child's mother cuts off a piece of its hair and going outside the house places the piece of hair on the ground and beats it with a club or stick. It is tabu to flash any glittering object about in the open since it is thought that this would bring on a thunderstorm, and the house would be liable to be struck by lightning.

On the night I passed at the communal house at Lanag I asked the Sakai to arrange to have a musical entertainment—I have said something about this elsewhere,—and suggested that the performance might be held in the open near the house. To this suggestion they demurred, and though they could not, or would not, state their objection very precisely, I understood that they thought that if they were to hold the entertainment in the open, their singing would cause mists to gather round them which would engender sickness.

The Hill Sakai told me that, on a death occurring, they buried the body and did not desert either their clearing or house. On the other hand the Jehehr, in talking about them afterwards, said that the hill people not only deserted the house, but left the corpse unburied in it. As I had no opportunity of investigating the matter further since this occurred after my return to Temengoh from my visit to them, I asked Pak Lebai Ishak who is local Malay Gembala of both the Jehehr and Orang Bukit what he could tell me about the matter. He replied that he had seen graves on hill tops at some distance from the clearing, but he seemed to think that the body might be occasionally deserted as the Jehehr said.

The avoidance of the mother-in-law is strictly observed and it is forbidden to speak to her, to pass in front of her, or even to hand anything to her.

There seems to be some prejudice against a man mentioning his own name, but it can scarcely be said to amount to a tabu.

When a woman is about to give birth to a child a small hut is built on the ground, and in this the event takes place. For three days after her delivery the mother may not eat rice or fish; *sengkuai* or *ubi* are allowable.

The flesh of the sambhur, the muntjac or wild pig is not eaten by women, as it is thought that it would cause sickness either in themselves or in their children.

Toh Stia told me that it was customary to take the *semangat sengkuai* (soul of the millet) and that the ceremony was performed by an old woman. On the first day of the proceedings, before reaping had been begun, she went into the crop and cut about a gantang measure of the *sengkuai* heads, and, on the second day, she again took the same amount. On the third day no reaping might be done, but on the fourth harvesting was started. Flowers, water and sireh were placed near the *semangat* which was hung up in the house. The *semangat* was finally mixed with the grain reserved for seed purposes.

The lunar eclipse is thought to be caused by an animal, or spirit, called *Pud*, which swallows the moon.

The custom in force among many Sakai tribes of never going out into the jungle with any craving unsatisfied, which I have referred to in previous papers on the Sakai of the Ulu Sungkai and on the Aborigines of Negri Sembilan, is also observed by the Sakai Bukit. Thus it is thought that if a Sakai were to start on a journey without chewing sireh, though he had wished to do so, some misfortune would be sure to overtake him.

The same belief (the evil effects following the breakage of the custom being called *kempunan* *) seems to be held by the Malays of Upper Perak and other districts. In connection with this belief the Sakai mentioned the word *shelentap*, and though I could not definitely find out its meaning—they said *shelentap* means "there is not"—it may possibly be equivalent to the *kempunan* of the Malays.

In marriage exogamy is usual, but not invariable, since whether or not a man takes a wife from another community partly depends on the presence or absence of girls of marriageable age and of a sufficiently distant degree of consanguinity in his own settlement. As far as I could ascertain, first cousins are within the prescribed degrees, but second cousins are not. When exogamy takes place the husband very frequently goes to live with his wife's family. This was so in the case of Toh Stia, a Sakai from the Plus River, who on my

* A Johore Malay, whom I recently questioned about the meaning of the word *Kempunan*, immediately said "going out without having eaten something you wanted to." Wilkinson translates the word as a "dilemma."

arrival was acting for Toh Rajah the real headman, his brother-in-law, who had gone over the main range into Kelantan.*

It is allowable to have two wives, but I gathered, not very usual. Children appear to be named from the place (the Malay word used was tanah) at which they are born. This would, I suppose, usually be the clearing on which the community was living in at the time of the event.

The musical entertainment, which I have mentioned above, was given by a small party of young men and women on the night I spent at the Hill Sakai's house.

As is usual at such gatherings the performance went on till day-break, but I only stopped to hear it for a couple of hours. The songs, which were not unmusical, were accompanied by the women with bamboo stampers, one of which they grasped in either hand. The words of the song were given out line by line by one of the men and followed by the others. Toh Stia made an attempt to tell me what the performers were saying and I gathered that the song was almost without meaning, the Sakai merely mentioning the names of mountains and rivers, saying that they felt very hungry, and proclaiming that "there was a boy who rode a horse" and other equally interesting items of intelligence.

* Toh Rajah returned from his wanderings while I was at the settlement.



I. H. N. Evans, Photo.

FIG. 1.

SEMANG OF GRIK, UPPER PERAK.



I. H. N. Evans, Photo.

FIG. 2.

JEHEHR OF TEMENGOH WITH BOW AND BLOWPIPE.



I. H. N. Evans, Photo.

FIG. 1.

JEHEHR OF TEMENGOH, UPPER PERAK.



I. H. N. Evans, Photo.

FIG. 2.

HILL SAKAI OF KUALA JINAHENG, UPPER PERAK.



J. H. N. Evans, Photo.

FIG. 1.

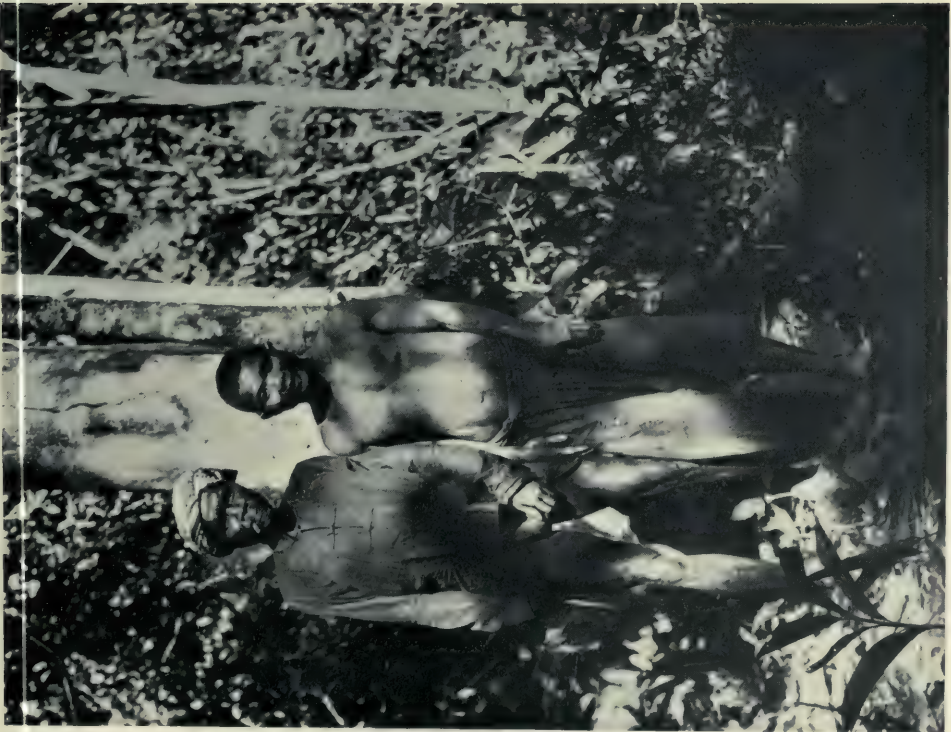
COMMUNAL HOUSE OF HILL SAKAI, TEMENGOH-LASAH BRIDLE-PATH, UPPER PERAK.



J. H. N. Evans, Photo.

FIG. 2.

HILL SAKAI WITH BOW.



HILL SAKAI OF KUALA JINAHENG, UPPER PERAK.

I. H. N. Evans, Photos.

XV. THE NATURAL HISTORY OF KEDAH PEAK.

By H. C. ROBINSON, C.M.Z.S., M.B.O.U., and
C. BODEN KLOSS, F.Z.S., M.B.O.U.

I. INTRODUCTION.

Kedah Peak, or Gunong Jerai, to use its Malay name, is a familiar landmark to all voyagers through the Straits of Malacca, dominating as it does the roadstead of Penang.

It is situated about 22 miles NNE of Penang with its summit about 6 miles from the sea and according to the latest computations attains a height of 3,976 feet being, if we except the Bintang Range on the Perak border, considerably the highest mountain in the State of Kedah. It is quite isolated, standing on a base that does not exceed 50 square miles, and is separated by low land not exceeding 50 feet in elevation from all other hills. Its slopes to the north and west are much steeper than those to the south and east and vertical rock faces, many hundreds of feet in height, exist. Geologically the mountain appears to consist of sandstones and quartzites of varying degrees of hardness, traversed by veins of quartz, while in one or two places deposits of haematite are found. It is well watered, being cut into by three great valleys which have been utilized for a water supply to the neighbouring districts and the cliffs are ornamented in several places by cascades which are very conspicuous after wet weather of any duration.

On the lower slopes the forest is now poor, timber cutting having been, until the last few years quite unrestricted, but a good deal of Meranti (*Shorea* and *Hopea* spp) is found up to about 2,000 ft., while Medang (*Lauraceae*) is also abundant. There is but little hard wood except in the first two or three hundred feet where it has almost all been cut out, and but little *jelotong*. We saw no taban of any kind. The stemless palms are by no means numerous and the forest generally is dry and with but little undergrowth.

On the Eastern side above about 1,800 feet where timber cutting ceases, the character of the forest changes and on the ridges great numbers of orchids begin to appear. Conifers, *Agathis*, *Dacrydium* (spp.) and *Podocarpus* are abundant and large shrubby Rhododendrons with salmon, lemon-yellow and white flowers begin to show themselves. In the damper hollows and among rocks near the streams a scarlet *Balanophora* was very abundant. Many of the ridges and flatter areas from 2,500 feet to the summit were clothed with a zerophitic vegetation, amongst which *Boeckia frutescens*, *Tristania*, *Leptospermum* and *Vaccinium* were the commonest shrubs, while in damp hollows amongst the rocks and amongst the coarse grasses and sedges that covered the more open spaces *Burmannia longifolia*,

a Purple and a Yellow *Utricularia* and two species of *Xyris* were very conspicuous. Melastomaceous plants and Begonias, in contradistinction to the flora of the Perak main range, were by no means common and only two or three species of gingerworts were met with. We did not see a single tree fern.

Collections were made in all groups of the animal kingdom and rather over two hundred species of flowering plants were obtained amongst which was an unusually large proportion of orchids. Very many species however were not in flower or in fruit at the time of our visit and it was therefore impossible to obtain identifiable specimens. This was especially the case among the *Gesneraceae*, of which about a dozen species were noted.

Animal life was extraordinarily poor, not only in species but also in individuals, and the only group represented by large numbers of specimens is the Lepidoptera Heterocera, of which considerable series were obtained by the use of a Lux lamp at night. In other groups the Millipedes were perhaps most abundant, though the number of species was not large. All orders of day flying insects were extremely scarce.

The most interesting capture of the trip was a specimen of *Eoperipatus* secured by a collector belonging to Dr. R. Hanitsch of the Raffles Museum, Singapore, who accompanied us. A single specimen was obtained in rotten wood at about 2,900 ft: though diligently searched for by ten other collectors for a day no other specimens were met with. The collections as worked out will be published group by group in this Journal. In the present number lists are given of the vertebrates.

Owing to the fact that there is now a railway station at its eastern foot, Kedah Peak has become very accessible and it is one of the easiest mountains to ascend that we have visited. From a practical point of view perhaps the most interesting feature attaching to it is that at about 3,300 ft. there exists a far better site for several hill bungalows than we know of at any similar altitude in the Peninsula.

The ascent from Gurun Station to Padang 'toh Seh, 3,200 ft., takes about three hours and the return journey about half that time. For the first two thousand feet the going is excellent in dry weather, a smooth and broad track having been formed by the extraction of baulks of timber drawn by buffalo, but as the subsoil is clayey this road becomes very slippery after rain though it is nowhere steep.

Between 1,500 ft. and 2,500 ft. there are an unusual number of flat spaces or slightly rounded ridges such as we have noted nowhere else and to this altitude the forest is open, with but little undergrowth.

Padang 'toh Seh is an open, somewhat rocky area (with abundant water near by) in a shallow gully between the actual summit and a ridge to the north. It is on the main track which continues westward and shortly beyond the Padang falls

steeply towards the sea, and is about 100 yards beyond the point where the path leading to the actual summit of the Peak branches off to the left.

The building site which lies N.W. beyond the Padang and four or five minutes distant, consists of a long, slightly undulating ridge running east and west, gently rounded from side to side, in some places flat, and varying in width from one to two hundred yards. It is covered with grasses, etc., pitcher-plants and orchids and is dotted throughout with bushes, (*Boeckia*, *Leptospermum*, *Vaccinium*, *Rhododendron* and heaths), of a general height of 3-10 ft. but on several of the highest points of the ridge where the soil is deeper some of these become small trees growing in clumps with a height of 15-20 ft. and afford a welcome broken shade on a fine day. Golden-flowered *Xyris* and a pretty free-blossoming pink *Argostemma* give colour to the herbage, while everywhere the growth is so open that charming views can be obtained in many directions and if a certain amount of clearing were done the whole surrounding sea and land could be seen except in the section SE-SW.

Roughly, that portion of the horizon is obscured by the secondary summit of the mountain, seen from the site, a steep-sided ridge running parallel to the southward, thickly wooded and rising 500 ft. higher. Seaward this drops sharply for 100 ft. and then descends more gently to become a narrow *arrête* which rises again to a lower peak in the S.W. and screens the island of Penang from view. Landward this summit drops more gently, the path to the Peak running near its profile, while across its base the inland plains and distant hills can be seen.

The prospect eastwards is closed by the continuation of the ridge from which these views are recorded but to the northward can be seen the wide-spreading plain under rice cultivation stretching right away to the hills of Perlis and bordered by the sea. Through this can be traced the railway to Alor Star and the town itself can be picked up with beyond it, the most conspicuous of all features, the precipitous mass of Gunong Keriang. The islands of Terutau and Langkawi lie clear on the horizon and running south in a long curve is the sea-shore with the mouth of the Kedah River jutting out in the centre, Pulau Paya is in the middle distance and the wooded islets of the Bunting group with their glistening yellow beaches are strung out in a line nearer in; while only about four miles away lie the village and fruit-groves of Yen, the mouth of its stream being marked by a long grove of cocopalms. Sails, and even canoes at sea, can be seen quite clearly.

The open portion of the ridge, on which the soil is very shallow and peaty and where numerous outcrops of sand-stone and quartzite occur, is some 7-800 yards long and is only fit for building purposes: inland, however, where the forest grows, the soil is much deeper and richer and the surface being rounded

and even flat, a considerable area is provided which is suitable for vegetable gardens with little need for terracing. Through the woods of the ridge a path runs more or less northwards and having a gentle slope affords a pleasant walk.

In all about 20 acres would be available for building while about half that area could be cleared of forest for gardening and cow-keeping.

There appears to be an ample supply of water all the year round in the gully. Though a few mosquitoes occur at night no *Anopheles* were included in the collection made.

The higher ridge near the summit has also some extent of flattish land but this is much smaller than the area available at the lower site and there would be a difficulty about water: also a good deal of cloud or mist is generally present so that the slightly lower temperature ($\pm 2^{\circ}$) due to an extra height of 4-500 ft. would not counter-balance the greater area and convenience of the other locality.

Quite close to this is the actual summit which is reached in about 50 minutes from Padang 'toh Seh: from it there is a clear view in all directions, including Penang and its shipping, the Muda River and the Larut Hills.

II.—MAMMALS.

The mammal fauna of Kedah Peak appears to be very poor. This is due to the fact that the mountain has never had any connection with the main range of the Peninsula while uncongenial conditions have as usual prevented the upward spread of the lowland forms. By far the most interesting of the few animals obtained were *Hylomys suillus*, *Epimys ferreocanus* and *Chiropodomys gliroides*.

Besides the species recorded below there were observed a tiger, binturong and some small bats, but none of these were obtained. Fresh tracks of tapir were frequently met with just below the summit and the goat-antelope is reported to inhabit some of the peaks, while the cries of a species of gibbon and leaf monkey were heard from the lower slopes.

I. SCIURUS VITTATUS MINIATUS.

Sciurus notatus miniatus, Miller, Proc. Acad. Nat. Sci., Washington, II, p. 79 (1900).

3 Males.

Three very typical specimens in which the red pencil of the tail extends nearly half-way towards the base.

Not at all common on the higher slopes of the mountain.

2. SCIURUS TENUIS SURDUS.

Sciurus tenuis surdus, Miller, Proc. Acad. Nat. Sci., Washington, II, p. 80 (1900).

3 Males, 7 Females.

By far the commonest squirrel on the mountain and not differing in any way from lowland animals: in no way approaching our recently described *S. t. gumong* from the Bandon hills [Journ. F.M.S. Mus., V. p. 119 (1914).]

3. EPIMYS VOCIFERANS.

Mus vociferans, Miller, Proc. Biol. Soc., Washington, xiii. p. 198 (1900), pls iii and iv, fig. 3.

2 Females.

Only two examples of this generally common hill rat were trapped.

4. EPIMYS SURIFER.

Mus surifer, Miller, Proc. Biol. Soc., Washington, xiii, p. 148 (1900), pl. v, fig. 4, a, b, c.

2 Males, 2 Females.

Four examples of this, the commonest spiny rat in the Peninsula, were obtained: the pelage of all is somewhat pale and dull.

5. EPIMYS CREMORIVENTER.

Mus cremoriventer, Miller, Proc. Biol. Soc. Washington, xiii, p. 144 (1900), pl. v, fig. 2, a, b, c.

1 Male, 1 Female.

This little rat has always been found sparsely distributed in the mountains of the Peninsula and only two individuals were obtained on the present occasion.

6. EPIMYS ASPER.

Mus asper, Miller, Proc. Biol. Soc. Washington, xiii, p. 145 (1900), pl. v, fig. 3, a, b, c.

22 Males, 8 Females.

This species was extremely common. It was found, here as elsewhere, to vary considerably in brightness of colouration, the yellow tone of the upper surface ranging from bright ochraceous-tawny to pale clay. The grey under surface is sometimes suffused with ochraceous but this feature is in no way correlated with a brighter back.

7. EPIMYS JALORENSIS.

Mus jalorensis, Bonhote, Fasciculi Malayenses, Zoology, Pt. 1, p. 28 (1903), pl. ii, figs 1 and 2; pl. iv. fig. 4.

3 Males, 2 Females.

These are representatives of the common *rattus* of the Malay subregion and though we have used for it the name applied by Bonhote we doubt, when large series of Malayan and Bornean animals are compared, that it will be considered in any way distinct from the subspecies *neglectus* of that island.

7. CHIROPDOMYS GLIROIDES.

Mus gliroides, Blyth, Journ. Asiat. Soc. Bengal, xxiv, p. 721 (1855).

3 Males, 1 Female.

Of this charming little rodent four individuals were obtained which were taken in the hollow internodes of bamboos. It was represented in our Museum hitherto by five examples only and we had regarded it as a species of rare occurrence in our area, but this scarcity in collections is possibly rather due to reasons of habitat and habit.

9. TUPAIA GLIS WILKINSONI.

Tupaia ferruginea wilkinsoni, Robinson and Kloss, Journ F.M.S. Mus, iv, p. 173 (1911).

1 Male, 1 Female.

These are rather dull coloured examples of this subspecies, the rump showing very little ferruginous tint; thus approaching, in its little-varied upper surface, the northern species *T. belangeri*.

10. HYLOMYS SUILLUS.

Hylomys suillus, Mull. and Schleg., Verhandelingen p. 153 (1839-44) pl. 25, figs. 4-7, pl. 26, fig. 1.

Though generally included as a member of our fauna this species seems to have been first definitely recorded from the Peninsula by Robinson whose collectors obtained an individual from the mountains of Selangor in 1910 [Journ. F.M.S. Mus. IV. p. 223 (1911)]. Several examples have since been captured in Perlis, the state north of Kedah, and now we have these two examples from Kedah Peak. We have compared them with animals from Sumatra (type region) and can discover no differences.

III. BIRDS.

We are aware of no paper dealing exclusively with the avifauna of the State of Kedah, nor indeed to our knowledge have any but very inconsiderable collections been made therein. A few species obtained by Cantor are mentioned by Moore in his "List of Malayan Birds collected by Theodore Cantor, M.D.," *P. Z. S.* 1854, pp. 258-285; 1859 pp. 443-468, while others obtained by the "Skeat Expedition" in 1899 are listed by *Bonhote, P. Z. S.* 1901 (i) pp. 57-81. To the east the avifauna of the Patani States is well known, that of Province Wellesley, Penang and Perak to the South and South-east has been thoroughly worked out, while to the north considerable collections have been obtained from the small boundary state of Perlis by the collectors of the Federated Malay States Museum, which disclose nothing of special interest.

To the north-east the fauna of Senggora is known from collections obtained by the "Skeat Expedition," which disclose no material difference between it and Patani and Jalor,

which was extensively worked by one of us. From the nature of the terrain it was not therefore probable that Kedah as a whole would disclose any form of special interest, but it was thought possible that Kedah Peak, rising as it does to a height of approximately 4,000 feet, might harbour some of the mountain species that are known from the main range mountains of the Federated Malay States to the south and from the mountains of Trang and Bandon to the North and North East. Moreover it was desirable to ascertain, whether the faunal boundary separating purely Malayan species from Tenasserimese races passed to the north or south of the peak.

With this object in view the mountain on its higher levels from the summit to about 2,500 feet was exhaustively searched from November 29th to December 11th, by three trained Dyak Collectors, well acquainted with the local fauna, and we do not think that they are likely to have missed any species really resident on the hill at the time.

As a result the hill was found to be extraordinarily barren in bird life, both species and individuals being very scarce, the only forms at all common being *Aethopyga temminckii*, *Turdinus magnirostris* and *Hemixus cinerea*.

The results conclusively show that Kedah Peak has never been connected either with the Trang mountains or those of the main range in such a manner as to permit the passage of the fauna of these two districts to it. The tradition in Malay Legend that until comparatively recent times the Peak was an island has probably therefore some foundation in geological fact.

Besides the specimens actually listed, three species of hornbills were seen and numerous individuals of a large *Spizaetus*, probably the black form of *Sp. linnaetus*, but these have no bearing on the general conclusions. No game birds were seen or heard nor did pigeons of any kind occur on the peak, though *Carpophaga badia* is usually found on mountains of this elevation. Round the summit *Hirundo javanica* and *H. gutturalis*, *Chaetura gigantea* and *Ch. leucopygialis* were noted, but no species of *Collocalia*.

The rarest and most interesting acquisition was *Prionochilus thoracicus*, of which but few specimens have ever been obtained in the Malay Peninsula, while *Anthus maculatus* and *Cichloselys sibericus* are rare seasonal visitors. The specimens obtained have been listed in detail but it has not been thought necessary to give any extensive references to the local literature. Occurrence to the north in Trang and Bandon have, however, usually been quoted.

RALLINA SUPERCILIARIS (Eyton).

Rallina superciliaris (Eyton); *Sharpe, Cat. Birds Brit. Mus. xxiii*, p. 76 (1894) *Robinson & Kloss, Ibis*, 1911, p. 10.

a. 1 Female imm. Kedah Peak, 3,000 ft. 30th November, 1915. No. 2,112. "Iris orange, bill dark slate, sea

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green at base of lower mandible, feet Payne's grey." H.C.R. & C.B.K.

This bird is quite immature and has the head earthy brown, uniform with the mantle. From the relative lengths of the tarsi and toes it would appear to be referable to this species and not to *Limnobaenus paykulli*, from which it is somewhat difficult to distinguish young birds.

ACCIPITER AFFINIS, Gurney.

Accipiter affinis, Gurney; *Robinson, Ibis*, 1915, p. 728.

a. 1 Male imm. Kedah Peak, 3,950 ft. 2nd December, 1915. [No. 2,142.] "Iris lemon yellow, bill slate, black on culmen, greenish yellow on cere and gape, tarsi, greenish yellow, toes more yellow." [H.C.R. & C.B.K.]

This specimen, which is in immature plumage, agrees well with Kloss' specimens from S. E. Siam. Total length, 270; wing, 158, tail, 128, tarsus, 45 bill from gape, 18 mm.

Several of these little hawks frequented the cliffs at the summit of the peak and hunted the Spine-tailed and common swifts that were common there, though they never seemed to be successful.

SCOPS MALAYANA, Hay.

Scops malayana, Hay; *Sharpe, Cat. Birds Brit. Mus.* ii, p. 58 (1875); *Robinson & Kloss, Ibis*, 1911, p. 31.

a. 1 Female. Kedah Peak, 3,000 ft. 5th December, 1915. [No. 2,181.]

"Iris chrome, bill horn, darker at tip, yellowish beneath, feet dirty whitish, yellowish on soles." H.C.R. & C.B.K.

This owl, whose soft hoot was heard on two or three nights, appears to be commoner in the northern half of the Peninsula than in the south, where very few specimens have been obtained.

CYPSELUS PACIFICUS (Lath.).

Cypselus pacificus (Lath.); *Robinson, Journ. Fed. Malay States Mus.* ii, p. 175, (1909).

a. 1 Male. Summit of Kedah Peak, 3,978 ft. 4th December, 1915. [No. 2,167.]

? Iris dark, bill black, feet pinkish black." [H.C.R. & C.B.K.]

In considerable numbers flying round and over the cliffs at the summit.

PYROTROGON ORESCIUS (Temm.).

Pyrotrogon orescius (Temm.); *Robinson & Kloss, Ibis*, 1911, p. 39; *Robinson, Journ. Fed. Malay States Mus.* v, p. 92 (1914).

a. b. 2 Females. Kedah Peak, 3,000 ft. 2—5th December 1915. [Nos. 2,141, 2,185.]

"Iris greyish-purple, bill and orbital skin smalt, culmen black, feet pale lead, soles pink." [H.C.R. & C.B.K.]

Not common on the hill. More abundant generally in the northern parts of the Peninsula than further south.

ZANCLOSTOMUS JAVANICUS (Horsf.).

Zanclostomus javanicus (Horsf.); *Shelley, Cat. Birds Brit. Mus.* xix, p. 370 (1891); *Robinson & Kloss, Ibis*, 1911, p. 42; *Robinson, Journ. Fed. Malay States Mus.* v, p. 94 (1914).

a.-d. 4 Males. Kedah Peak, 3,000 ft. 29th November—5th December, 1915. [Nos. 2,106, 2,168, 2,170, 2,172.]

"Iris claret, orbital skin smalt, bill coral, feet Payne's grey, soles dirty yellow." [H.C.R. & C.B.K.]

Very common, climbing about the trees in the laboured way peculiar to this group of Cuckoos. Widely spread throughout the Peninsula, ascending the hills to over 4,000 ft.

ALSEONAX LATIROSTRIS (Raffles).

Alseonax latirostris (Raffles); *Sharpe, Cat. Birds Brit. Mus.* iv, p. 127 (1879); *Robinson & Kloss, Ibis*, 1911, p. 51 Male.

a. 1 Female. Kedah Peak, 3,000 ft. 3rd December 1915. [No. 2,151.]

"Iris dark hazel, bill dark horn, basal half of lower mandible yellowish white, feet brownish grey." [H.C.R. & C.B.K.]

CYORNIS CONCRETA (S. Mull.).

Pachycephala cyanea (Hume); *Gadow, Cat. Birds Brit. Mus.* viii, p. 224 (1883).

Cyornis concreta (S. Mull.); *Hartert, Nov. Zool.* ix, p. 549 (1902); *Robinson, Journ. Fed. Malay States Mus.* v, p. 25 (1914).

a, b. 2 Males. Kedah Peak, 3,000 ft. 30th November—3rd December, 1915. [Nos. 2,108, 2,148.]

"Iris dark hazel, bill black, feet greyish black." [H.C.R. & C.B.K.]

Of late years this anomalous flycatcher has been found on most of the mountains of the Malay Peninsula from about 1,000 ft. to 3,500 ft. It is, however, nowhere common.

POLIOMYIAS LUTEOLA (Pall.).

Poliomyias luteola (Pall.); *Sharpe, Cat. Birds Brit. Mus.* iv, p. 201 (1879).

a. 1 Female. Kedah Peak, 3,000 ft. 6th December 1915. [No. 2,189.]

"Iris dark, bill corneous, feet greenish brown." [H.C.R. & C.B.K.]

A migrant, widely distributed throughout the Malay Peninsula, especially on the islands off the coast from September to May.

PHILENTOMA PYRRHOPTERUM (Temm.).

Philentoma pyrrhopterum (Temm.); *Sharpe, Cat. Birds Brit. Mus.* iv, p. 366 (1879); *Robinson & Kloss, Ibis*, 1911, p. 53; *Robinson, Journ. Fed. Malay States Mus.* v, p. 100 (1914).

a, b. 1 Male, 1 Female. Kedah Peak, 3,000 ft. 9th December 1915. [Nos. 2,219—20.]

"Male: iris red, bill black, feet lavender. Female: iris red, bill pale horn, whitish at gape, feet pale brown." [H.C.R. & C.B.K.]

Widely distributed all over the Peninsula, commoner in the more northern districts.

RHINOMYIAS PECTORALIS (Salvad.).

Rhinomyias pectoralis (Salvad.); *Sharpe, Cat. Birds Brit. Mus.* iv, p. 368 (1879); *Hartert, Nov. Zool.* ix, p. 553 (1902).

a—b. 1 Male, 1 Female. Kedah Peak, 3,000 ft. 2—5th December 1915. [Nos. 2,146, 2,184.]

"Iris hazel, bill black, feet livid purplish pink." [H.C.R. & C.B.K.]

Not very common anywhere but found at medium elevations throughout the Peninsula.

CHLOROPSIS ICTEROCEPHALA (Less.).

Chloropsis icterocephala (Less.); *Sharpe, Cat. Birds Brit. Mus.* vi, p. 30 (1881).

a—f. 4 Males, 2 Females. Kedah Peak, 3,000 ft. 3rd—8th December 1915. [Nos. 2,155, 2,175, 2,182, 2,197, 2,209—10.]

Male: iris rich hazel brown, bill black, feet greenish lead. Female: iris chestnut, bill slate, greenish slate on lower mandible, feet pale greenish plumbeous." [H.C.R. & C.B.K.]

Fairly common on the peak, which is nearly the northern limit of the species. The form occurring in Trang and Bandon is *C. chlorocephala*, while birds from Perlis immediately to the north of Kedah are intermediate.

HEMIXUS CINEREUS (Blyth).

Hemixus cinereus (Blyth); *Sharpe, Cat. Birds Brit. Mus.* vi, p. 52, pl. 11 (1881).

a—h. 8 Males. Kedah Peak, 3,000 ft. 29th November—7th December 1915. [Nos. 2,103—4, 2,138, 2,147, 2,165—6, 2,198, 2,201.]

"Iris red or chocolate, bill black, feet greyish brown, soles yellowish flesh. Common everywhere on the hill in parties of two or three.

Several of the specimens have the undertail coverts faintly washed with greenish, which is apparently an indication of immaturity.

HEMIXUS MALACCENSIS (Blyth).

Hemixus malaccensis (Blyth); *Sharpe, Cat. Birds Brit. Mus.* vi, p. 52 (1881); *Robinson and Kloss, Ibis*, 1911, p. 56; *Robinson, Journ. Fed. Malay. States Mus.* v, p. 102 (1914).

a—c. 1 Male, 2 Females. Kedah Peak, 3,000 ft. 30th November—9th December 1915. [Nos. 2,113, 2,132, 2,217.]

"Iris chocolate, orange, or ochraceous, bill dark greenish slate, brownish on lower mandible, feet pinkish brown." [H.C.R. & C.B.K.]

Widely spread in the Peninsula in the same situations as the preceding species but not so common or conspicuous a bird.

CRINIGER TEPHROGENYS (Jard. and Selby).

Criniger tephrogenys (Jard. and Selby); *Hartert. Nov. Zool.* ix, p. 558 (1902);

a—e. 2 Males, 1 Female. Kedah peak, 3,000 ft. 7-9th December 1915. [Nos. 2,200, 2,215-6.]

"Iris reddish brown, bill slate, black on culmen, feet yellowish pink." [H.C.R. & C.B.K.]

This is the yellowish low-country and southern form not *C. ochraceus*, Moore, which occurs further north and in the mountains of the southern part of the Peninsula above about 3,000 ft.

PYCNONOTUS SIMPLEX, Less.

Pycnonotus simplex, Lesson; *Sharpe, Cat. Birds Brit. Mus.* vi, p. 153 (1881).

a—c. 2 Males, 3 Females. Kedah Peak, 3,000 ft. 3-7th December 1915. [Nos. 2,149, 2,159-60, 2,194, 2,203.]

"Iris white, bill black or dark horn, feet pinkish brown." [H.C.R. & C.B.K.] Agreeing well with other specimens from the southern parts of the Peninsula in having the ear-coverts entirely unstreaked therein differing from the more northern form *P. robinsoni*, Ogilvie Grant. Wing 86-76 mm.

There is considerable doubt as to the proper name to be applied to this bulbul which can probably be divided into numerous local races. Pending a general investigation of the whole group we have adopted that generally used by English authors.

RUBIGULA CYANIVENTRIS (Blyth).

Rubigula cyaniventris (Blyth); *Sharpe, Cat. Birds Brit. Mus.* vi, p. 169 (1881); *Robinson, Journ. Fed. Malay States Mus.* ii, p. 196 (1909).

a. 1. Male. Kedah Peak, 3000 ft. November 30th 1915. [No. 2,120.]

"Iris dark blue, bill black, feet pale slate." [H.C.R. & C.B.K.]

The only one met with. Common all over the Peninsula up to 3,000 ft.

TURDINUS MAGNIROSTRIS (Moore).

Turdinus magnirostris (Moore); *Sharpe, Cat. Birds Brit. Mus.* vii, p. 547 (1883); *Robinson, Journ. Fed. Malay States Mus.* v, p. 103 (1914).

a—k. 7 Males, 4 Females. Kedah Peak, 3,000 ft. 30th November—6th December, 1915.

Nos. 2,109-10, 2,124-7, 2,130-1, 2,154, 2,158, 2,193.

"Iris carmine, brick-red or Indian red, bill slate, the culmen black, feet pale lavender." [H.C.R. & C.B.K.]

One of the commonest of submontane birds met with in small trees and low bushes in the undergrowth. It is one of the few Timeline birds that is at all common on the islands off the Peninsular coast.

ANUOPSIS MALACCENSIS (Hartl.)

Anuopsis malaccensis (Hartl.); *Sharpe, Cat. Birds Brit. Mus.* vii, p. 588 (1883).

a—d. 2 Males, 2 Females. Kedah Peak, 3,000 ft. 29th November—2nd December, 1915. [Nos. 2,100, 2,107, 2,143-4.]

"Iris red or chestnut, bill slate, black on culmen, feet fleshy pink." [H.C.R. & C.B.K.]

A common scrub bird ranging in altitude to about 3,000 feet but not extending much further north than Trang.

CORYTHOCICHLA LEUCOSTICTA, Sharpe.

Corythocichla leucosticta, *Sharpe, P.Z.S.* 1887, p. 438; *Robinson & Kloss, Ibis*, 1911, p. 61; *Robinson, Journ. Fed. Malay States Mus.* v, p. 104 (1914).

a. 1 Male. Kedah Peak, 3,000 ft. 29th November, 1915. [No. 2,099.]

"Iris carmine, bill bluish horn, blackish at base, feet greyish brown." [H.C.R. & C.B.K.]

It was somewhat surprising to meet this short-tailed Babbler on Kedah Peak, where none of the other species with which it is usually associated occur. Of late years it has, however been met with in several other outlying situations notably on Gunong Tampin in Negri Sembilan and on Pulau Tioman off the coast of Pahang.

ALCIPPE CINEREA, Blyth.

Alcippe cinerea, Blyth; *Sharpe, Cat. Birds Brit. Mus.* vii, p. 622 (1883); *Robinson & Kloss, Ibis*, 1911, p. 61; *Robinson, Journ. Fed. Malay States Mus.* v, p. 105 (1914).

a—h. 6 Males, 2 Females. Kedah Peak, 3,000 ft. 1st-9th December, 1915. Nos. 2,128, 2,183, 2,191-2, 2,206-8, 2,218.

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"Iris reddish hazel, bill dark horn, tomia and gape paler, feet pinkish slate." [H.C.R. & C.B.K.]

Common everywhere on the lower hills of the Peninsula as far North as Bandon, but more numerous in the South.

STACHYRHIS NIGRICEPS subsp. *DAVISONI*, Sharpe.

Stachyrhis davisoni, Sharpe, *Bull. Brit. Orn. Club*, i, p. vii, (1892); Robinson & Kloss, *Ibis*, 1911, p. 61; Robinson, *Journ. Fed. Malay States Mus.* v, p. 105 (1914).

Stachyrhis nigriceps davisoni, Harington, *Journ. Nat. Hist. Soc. Bombay*, xxiii, p. 625 (1915).

a—c. 3 Females. Kedah Peak, 3,000 ft. 30th November—4th December, 1915. [Nos. 2,123, 2,161—2.]

"Iris pale hazel, chestnut or chocolate, bill slate, the culmen black, feet greyish brown with a greenish cast." [H.C.R. & C.B.K.]

On low trees and shrubs, fairly common. Apparently ranging from the extreme south of the Peninsula northwards to Karen-nee. The above specimens exactly agree with topotypes from the Tahan River with which they have been compared.

HERPORNIS ZANTHOLEUCA (Hodgs).

Herpornis zantholeuca (Hodgs): Sharpe, *Cat. Birds, Brit. Mus.* vii, p. 636 (1883); Robinson & Kloss, *Ibis*, 1911 p. 63; Robinson, *Journ. Fed. Malay States Mus.* v, p. 107 (1914).

a—i. 6 Males, 3 Females. Kedah Peak, 3,000 ft. 3rd—9th December, 1915. [Nos. 2,152, 2,157, 2,169, 2,173—4, 2,196, 2,199, 2,205, 2,221.]

"Iris dark brown or hazel, bill pinkish horn, feet yellowish pink. [H.C.R. & C.B.K.]

A very common and characteristic submontane bird, not found as a rule above 3,500 ft. or at low elevations near the coast.

CICHOSELYS SIBERICUS (Pall).

Cichloselys sibericus (Pall); Robinson, *Journ. Fed. Malay States Mus.* ii, p. 206 (1909).

a—c. 3 Females. Kedah peak, 3,000 ft. 29th November—2nd December, 1915. [Nos. 2,098, 2,105, 2,140.]

"Iris dark hazel, bill black, yellowish green on base of lower mandible, yellow at the gape, tarsi and feet brownish yellow, more yellow posteriorly and on the soles." [H.C.R. & C.B.K.]

A migrant found during the winter months on several of the higher mountains of the Peninsula.

HYDROCICHLA RUFICAPILLA (Temm).

Hydrocichla ruficapilla (Temm); Sharpe, *Cat. Birds Brit. Mus.* vii, p. 319 (1885); Robinson *Journ. Fed. Malay States Mus.* ii, p. 207 (1909).

a. 1 Male. Kedah peak, 3,000 ft. 2nd December 1915, [No. 2,139.]

"Iris dark hazel, bill black, feet pale whitish pink." [H.C.R. & C.B.K.]

Not common. Elsewhere in the Peninsula it is abundant on mountain streams up to about 3,500 feet.

LARVIVORA CYANEA (Pall).

Larvivora cyanea (Pall); *Robinson, Journ. Fed. Malay States Mus.* ii, p. 207 (1909); *id. op. cit.* v, p. 149 (1914); *Robinson & Kloss, Ibis* 1911, p. 64.

a—b. 2 Females. Kedah Peak, 3,000 ft. 5th December 1915. [Nos. 2, 176, 2, 178.]

"Iris hazel, upper mandible horn, lower pinkish, tarsi and feet pale pinkish white." [H.C.R. & C.B.K.]

Common throughout the Peninsula in the winter months, though possibly some few individuals remain throughout the year as it has been obtained as late as May 16th.

ORTHOTOMUS ATRIGULARIS (Temm).

Orthotomus atrigularis (Temm); *Sharpe, Cat. Birds Brit. Mus.* vii, p. 220 (1883); *Robinson, Journ. Fed. Malay States Mus.* ii, p. 208 (1909).

a—b. 2 Males. Kedah Peak, 3,000 ft. 2—3rd December 1915. [Nos. 2, 145, 2, 156.]

"Iris brown or hazel red, bill pinkish horn, darker on culmen, feet brownish pink." [H.C.R. & C.B.K.]

Here reaching about its maximum elevation. Common about low bushes in the clearing.

PHYLLOSCOPUS BOREALIS subsp. BOREALIS (Blas).

Phylloscopus borealis borealis, *Hartert, Vog. Pal. Faun.* I. 1909, p. 517; *Robinson, Ibis*, 1915, p. 754.

a—h. 5 Males, 3 Females. Kedah Peak, 3,000 ft. 29th November—9th December, 1915. [Nos. 2, 101—2, 150, 2, 153, 2, 180, 2, 188, 2, 204, 2, 213.]

"Iris hazel, bill yellowish, upper mandible and tip brownish horn, feet brownish, yellowish posteriorly." [H.C.R. & C.B.K.]

A very common winter visitor to the Malay Peninsula. All these specimens are in worn and faded plumage and are difficult to make out. The wing measurement varies from about 63–67 mm. so they cannot be referred to the larger eastern race *P. b. zanthodryas*, Swinh.

MELANOCHLORA FLAVOCRISTATA (Lafr).

Melanochlora flavocristata (Lafr.); *Robinson and Kloss, Ibis*, 1911, p. 70; *Robinson, Journ. Fed. Malay States Mus.* v, p. 108 (1914).

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a—b. 2 Males. Kedah Peak, 3,000 ft. 5th December, 1915. [Nos. 2,177, 2,179.]

"Iris hazel, bill black, feet greenish slate." [H.C.R. & C.B.K.]

One flock only was met with; elsewhere the species is numerous, throughout the submontane tracts of the Peninsula.

MOTACILLA MELANOPE, Pall.

Motacilla melanope, Pall.; *Sharpe, Cat. Birds Brit. Mus.* x, p. 497 (1895); *Robinson and Kloss, Ibis*, 1911, p. 73.

a. 1 Female. Kedah Peak, 3,000 ft. 9th December 1915. [No. 2214.]

"Iris dark, bill bluish slate, darker on culmen, feet pale brownish." [H.C.R. & C.B.K.]

The only one seen, though this wagtail is usually common on forest paths up to a considerable altitude during the winter months.

ANTHUS MACULATUS, Hodgs.

Anthus maculatus, Hodgs.; *Sharpe, Cat. Birds Brit. Mus.* x, p. 547 (1885); *Robinson and Kloss, Ibis*, 1911, p. 478.

a. 1 Female. Kedah Peak, 3,000 ft. 30th November, 1915. [No. 2,117.]

"Iris dark, upper mandible horn, lower pink, feet whitish pink." [H.C.R. & C.B.K.]

A rare winter visitor to the Malay Peninsula, only two other records of its occurrence being to hand.

AETHOPYGA TEMMINCKI (S. Müll.)

Aethopyga temmincki (S. Müll.); *Gadow, Cat. Birds Brit. Mus.* ix, p. 16 (1884).

a—l. 10 Male ad., 1 Male imm, 1 Female. Kedah Peak, 3,000 ft. 29th November—9th December 1915. [Nos. 2,111-2, 2,111a., 2,114-5, 2,122, 2,129, 2,171, 2,186-7, 2,195, 2,211-2.]

"Iris dark, feet reddish brown, bill brownish horn" [H.C.R. & C.B.K.]

Exceedingly common in open spaces at 500 feet, and over, together with the Flowerpeckers.

This is a very characteristic submontane bird inhabiting the zone between about 500 ft. and 3,000 ft. In the coast lands it is replaced by *Ae. siparaja* and *Ae. s. cara* and on the higher mountains by *Ae. wrayi*, Sharpe.

The present species has a pleasant though feeble little song and is very active and restless in its movements. On Kedah Peak females were curiously scarce and hardly any were seen.

DICAENUM TRIGONOSTIGMA (Scop.)

Dicaeum trigonostigma (Scop.); *Sharpe, Cat. Birds Brit. Mus.* x, p. 38 (1885).

a—f. 5 Males, 1 Female. Kedah Peak, 3,000 ft. 30th November—8th December 1915. [Nos. 2,118-9, 2,133-4, 2,137, 2,202.]

"Male: iris dark, bill greenish slate, paler at the base of the lower mandible, feet dark slaty green. Female: iris dark, bill pale orange, culmen and tip horn brown, feet dark green slate." [H.C.R. & C.B.K.]

Common on flowering trees in open spaces near our camp.

Abundant everywhere in the Peninsula up to about 3,500 ft.

PRIONOCHILUS IGNICAPILLUS (Eyton).

Prionochilus ignicapillus (Eyton); *Sharpe, Cat. Birds Brit. Mus.* x, p. 65 (1885).

a—b. 2 Males. Kedah Peak, 3,000 ft. 4th December, 1915. Nos. 2163-4.

"Bill black, iris chestnut, feet slaty black, lower mandible slate except at tip." [H.C.R. & C.B.K.]

Not very common on Kedah Peak. Sparsely distributed throughout the Peninsula, attaining about 3,000 ft. as its maximum elevation.

PRIONOCHILUS MACULATUS (Temm.).

Prionochilus maculatus (Temm.); *Sharpe, Cat. Birds Brit. Mus.* x, p. 69 (1885).

a. 1 Female. Kedah Peak, 3,000 ft. 6th December, 1915. [No. 2,190.]

b. 1 Male. Gurun, Kedah 50 ft. 13th December, 1915. [No. 2,252.]

"Iris chestnut, bill slate, the culmen black, feet dark greenish slate." (H.C.R. & C.B.K.)

Not so common as others of the family but very generally distributed over the whole length of the Peninsula, from Bandon to Singapore.

PRIONOCHILUS THORACICUS (Temm.).

Prionochilus thoracicus, *Sharpe, Cat. Birds Brit. Mus.* x, p. 67 (1885); *Ogilvie Grant, Journ. Fed. Malay States Mus.* iii, p. 19 (1909); *Robinson, Journ. Straits Branch. Roy. Asiat. Soc.* No. 57, p. 14 (1911).

a—c. 3 Male. Kedah Peak, 3,000 ft. 30th November—1st December, 1915. [Nos. 2,121, 2,135-6.]

"Iris dark, bill black, feet greenish slate." [H.C.R. & C.B.K.]

This bird was found singly feeding on the flowers of a small species of *Eugenia* growing in open tracts on the mountain. Though very common in Borneo it is one of the rarest of Peninsular birds and of late years has been met with on only two occasions, once on Gunong Tahan at 3,000 ft. and again at Temengoh, in Upper Perak, at low elevations.

IV. REPTILES and BATRACHIANS.

As with the other vertebrata these appeared to be very scarce on Kedah Peak and none were obtained of any special interest excepting perhaps *Mabua novemcarinata* which has not often been met with in the southern half of the Peninsula.

The references are to Boulenger's recent volume on the Reptilia and Batrachia of the Malay Peninsula.

1. GYMNODACTYLUS PULCHELLUS (Gray).

Blgr. p. 36.

A young example of this beautiful gecko was obtained at 3,000 ft. Snout to vent 55 mm. Above brownish-yellow with four broad black bands on the trunk and another on the head running from the eyes round the nape, all narrowly edged with bright lemon-yellow. Rostrum and limbs brown; a narrow lemon-yellow band between, and in front of, the eyes; supra-orbital regions greenish. Tail white with nine broad black bands. Under surface deep fleshy-pink.

2. DRACO MELANOPOGON, Blgr.

Blgr. p. 62.

3 Males, 1 Female.

Evidently not uncommon on the Peak but the only flying-lizard met with.

3. APHIANOTIS FUSCA (Peters).

Blgr. p. 64.

A single specimen was obtained at 2,000 ft.

4. MABUA NOVEMCARINATA (And).

Blgr. p. 82.

Two small examples of this lizard, rare in the Peninsula, were obtained at 3,000 ft.

Besides the foregoing scink a small lizard, probably *Lygosoma* sp. was frequently observed on the extreme summit where it lived among the grass and stones; it was, however, too rapid in movement to allow of capture.

5. TROPIDONOTUS TRIANGULIGERUS, Boie.

Blgr. p. 125.

One example from 3,000 ft. taken by the banks of a stream.

6. COLUBER OXYCEPHALUS, Boie.

One example from 3,000 ft. Its brilliant green colour and tail of orange black-edged scales render this a remarkably handsome snake.

7. DENDROPHIS FORMOSUS, Boie.

Blgr. p. 145.

One small individual from 3,000 ft.

8. DRYOPHIS PRASINUS, Boie.

Blgr. p. 175.

One example from 3,000 ft.

9. LACHESIS WAGLERI (Boie.)

Blgr. p. 218.

One specimen from 3,000 ft.

10. RANA MACRODON, Dum. and Bibr.

Blgr. p. 233.

An immature example of this frog was obtained at 3,000 ft, measuring 78 mm. from snout to vent.

11. RHACOPHORUS LEUCOMYSTAX (Gravenh).

Blgr. p. 249.

One specimen of this frog was obtained at 3,000 ft. It is the commonest of its genus in the Peninsula.

12. BUFO ASPER, Gravenh.

Blgr. p. 271.

Two full-grown examples from 3,000 ft.

13. MEGALOPHRYS NASUTA (Schleg.)

Blgr. p. 279.

A small example (snout to vent 55 mm.) was met with at 3,000 ft. Colour of body above yellowish-brown with a reddish-chocolate area covering the back, extending over the sides and forking on the nape to the eyelids.

APPENDIX.

During our stay at Alor Star previous to our ascent of Kedah Peak and at Gurun after our return, small collections were made. Few things therein were of any special interest, but a list of the species is here given for the sake of the locality.

I—MAMMALS.

1. PRESBYTIS OBSCURA.

Semnopithecus obscurus, Reid, P.Z.S., 1837, p. 14.

1 Female imm. Gurun, Kedah.

2. *PTEROPUS VAMPIRUS MALACCENSIS*.

Pteropus vampyrus malaccensis, K. Andersen, Ann. & Mag. Nat. Hist. (8) II, p. 363 (1902).

A single immature example of this fruit-bat was obtained at Gurun: it is a half-grown individual with a forearm of 175 mm. only.

3. *CYNOPTERUS BRACHYOTIS*.

Pachysoma brachyotis, S. Mull, Tyd. Nat. Gesch., V, pt. 1 p. 146 (1838).

2 Males, 15 Females. Gurun, Kedah.

A large number of smaller fruit bats were obtained at Gurun but those which were obviously immature were not preserved. As shown by the external measurements given below, they are undoubtedly examples of *C. b. brachyotis*.

Head and Body	...	89	— 95
Ear from orifice	...	16	— 18.
Forearm	...	60	— 65.5
3rd Metacarpal	...	39	— 44.5
Tibia	...	21.5	— 24.5 mm.

4. *TAPHOZOUS MELANOPOGON*, subsp.

Taphozorus melanopogon, Temm. Mon. Mamm., II, p. 287, p. 60, figs. 8, 9 (1835—41).

14 Males, 13 Females. Gunong Kriang, Kedah.

Gunong Kriang, 700 ft. high, is an isolated and precipitous limestone mass standing in the flat Kedah plain some miles north of Alor Star. It is penetrated by deep tunnel-like caves and in its walls are many more of a shallower nature. These latter are inhabited by large numbers of bats of this species but no others were met with.

These examples resemble all other specimens of *melanopogon* from the Malay Peninsula and adjacent islands but appear to differ from the typical race in having paler fur and wing-membranes which are almost white.

5. *SCIURUS CONCOLOR*.

Sciurus concolor, Blyth, Journ. Asiat. Soc. Bengal, XXIV, p. 474 (1855).

1 Female.

A very typical example, showing no approach to *Sc. milleri*, Robinson and Wroughton [Journ. F. M. S. Mus. IV, p. 233 (1911)] from Trang, a state to the north of Kedah.

6. *SCIURUS VITTATUS MINIATUS*, Miller.

1 Male, 2 Females.

7. EPIMYS SURIFER (Miller).

2 Males, 1 Female.

Of similar dull colour to specimens from the Peak.

8. EPIMYS ASPER (Miller.)

2 Females.

9. EPIMYS FERREOCANUS (Miller.)

Mus. ferreocanus, Miller, Proc. Biol. Soc. Washington, XIII, p. 140 (1900), pls. III and IV, figs 2, a.

2 Females.

This rare Malayan rat has hitherto been taken only on the mountains at altitudes of 3,000 ft. or so. It was therefore a surprise to find that it occurred in the plains at the foot of Kedah Peak, while it was not met with on that mountain itself.

10. GALEOPTERUS PENINSULAE, Thomas.

Galeopterus peninsulae, Thomas, Ann. and Mag. Nat. Hist. (8) 11, p. 303 (1908).

1 Male.

11. TUPAIA GLIS WILKINSONI, Robinson and Kloss.

2 Females.

Typical specimens with ferruginous rumps and thus rather brighter than the examples from the Peak.

12. TRAGULUS KANCHIL RAVUS.

Tragulus rarus, Miller, Proc. Biol. Soc. Washington, XV, p. 173 (1902).

1 Male.

The lesser Malayan mouse-deer (pelandoc), appeared to be very common at Gurun, as during our stay of a couple of days a number were brought to us by the inhabitants who, however, said they were unable to trap the napu or larger mouse-deer.

In the examples of the pelandoc which we examined the nape-stripe was a clear black, sharply margined and contrasted with the colour of the sides of the neck, and cannot quite be matched by numerous other examples from all parts of the Peninsula.

2. BIRDS.

PELARGOPSIS MALACCENSIS, Sharpe.

a. 1 Female. Gurun Kedah 50 ft. 12th December, 1915. [No. 2,237.]

"Iris dark brown, bill maroon, tip black, tarsi and orbits coral, claws dark." [H.C.R. & C.B.K.]

Precisely agreeing with southern specimens and showing no approach to the northern form, *P. g. burmanica*, Sharpe.

HALCYON PILEATA (Bodd.).

a. 1 Male. Gurun Kedah, 50 ft. 14th December, 1915.
[No. 2,256.]

SURNICULUS LUGUBRIS (Horsf.)

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915.
[No. 2,254.]

"Iris dark brown, bill, feet brownish black." [H.C.R. & C.B.K.]

HIEROCOCCYX NANUS, Hume.

Hierococcyx nanus, Hume; *Shelley, Cat. Birds Brit. Mus.* xxx, p. 238 (1892); Robinson & Kloss, *Journ. Fed. Malay States Mus.* v, p. 172 (1915).

a. 1 Male. Gurun, Kedah, 50 ft. December 11th, 1915.
[No. 2,224.]

"Iris very dark brown, bill greenish slate, base of upper mandible black, orbital skin and gape pale chrome, feet yellow, claws pale wax yellow. [H.C.R. & C.B.K.]

This specimen agrees well with two others in the Museums, one from the Krau River, Pahang, collected on 31st October, 1913 and another from Ginting Bidei, Selangor-Pahang border, 2,300 ft., obtained on September 30th 1914.

Measurements of the above bird taken in the flesh. Total length 281; wing 150; tail, 158; tarsus, 20; bill from gape, 30 mm.

Wing of the Krau River Bird, 146 mm. Of the Ginting Bidei one, 147 mm.

This species is extremely rare in the Malay Peninsula proper and the above three specimens are the only ones from our area of which we have any record, with the exception of the birds from Salanga or Junk Zeylon, recorded by Muller (*Journ. fur. Orn.* 1882, p. 405). It is probably commoner in Tenasserim.

RHOPODYTES DIARDI (Less.)

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915.
[No. 2,241.]

"Iris pale blue, orbital skin crimson lake, feet dark greenish slate, bill sea green, area of nostrils bluish." [H.C.R. & C.B.K.]

CHOTORHEA VERSICOLOR (Raffles).

a—b. 2 Females. Gurun, Kedah, 50 ft. 12th December, 1915. [Nos. 2,227, 2,233.]

"Iris chestnut, bill black, slaty at base, feet greenish lead." [H.C.R. & C.B.K.]

CHRY SOPHLEGMA MALACCENSE (Lath).

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915.
[No. 2,242.]

"Iris chestnut, upper mandible black, lower slate, feet plumbeous green." [H.C.R. & C.B.K.]

CYMBORHYNCHUS MACRORHYNCHUS (Gm.)

Cymborhynchus macrorhynchus (Gm.) *Robinson, Ibis*, 1915, p. 740.

a—b. 1 Male, 1 Female. Gurun, Kedah, 50 ft. 11–12th December, 1915. [Nos. 2,223, 2,238.]

"Iris emerald, bill robin's egg blue, lower mandible chrome yellow, except gape and tomia, tarsi smalt grey.

Of these two specimens one has a marked white patch on the inner web of the three outer pairs of tail feathers and the other on the outermost pair only. One just received from Paku Saribas, Southern Sarawak, Borneo has no white whatever on the tail.

PITTA CYANOPTERA, Temm.

a. 1 Female. Gurun, Kedah, 50 ft. 12th December, 1915. [No. 2,232.]

"Iris hazel, bill black, pinkish yellow at gape, feet fleshy pink." [H.C.R. & C.B.K.]

HYPOTHYMIS AZUREA subsp. PROPHATA, Oberholser.

a. 1 Female. Gurun, Kedah, 50 ft. 13th December, 1915. [No. 2,251.]

"Iris dark, bill black, feet slaty black." [H.C.R. & C.B.K.]

TERPSIPHONE PARADISI subsp. AFFINIS, Blyth.

a. 1 Female imm. Gurun, Kedah, 50 ft. 12th December 1915. No. 2,229.

"Iris dull green; eye, wattle, and tarsi, smalt; bill pale lead.

Being in quite immature plumage the identification of this specimen is somewhat doubtful; it may possibly be *T. p. incii*, Gould.

PHILENTOMA VELATUM (Temm.)

a—b. 1 Male, 1 Female. Gurun, Kedah, 50 ft. 13th December, 1915. [Nos. 2,250, 2,253.]

"Iris carmine, bill and feet black." [H.C.R. & C.B.K.]

ARTAMIDES SUMATRENSIS (S. Müll).

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915. [No. 2,240.]

"Iris yellowish white, bill black, feet powdery black." [H.C.R. & C.B.K.]

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Always a rather rare bird, but widely distributed throughout the Malay Peninsula.

CHLOROPSIS CYANOPOGON (Temm).

a—c. 2 Males, 1 Female. Gurun, Kedah, 50 ft. 14th December, 1915. [No. 2,257-9.]

EUPTILOSUS EUPTILOSUS (Jard. and Selby).

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915. [No. 2,248.]

"Iris red, bill black, feet slaty black." [H.C.R. & C.B.K.]

MICROTARSUS MELANOCEPHALUS (Gm).

a. 1 Female. Gurun, Kedah, 50 ft. 12th December, 1915. [No. 2,228.]

"Iris turquoise, bill black, feet dark olive brown." [H.C.R. & C.B.K.]

TRICHOLESTES CRINIGER (Blyth).

a. 1 Male. Gurun, Kedah, 50 ft. 13th December 1915. [No. 2,249.]

"Iris greyish white, bill bluish horn, feet yellowish flesh." [H.C.R. & C.B.K.]

PELLORNEUM SUBOCHRACEUM, Swinh.

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915. [No. 2,247.]

"Iris hazel, orbital skin greenish yellow, bill pale horn, base of lower mandible and gape yellow, feet yellowish flesh." [H.C.R. & C.B.K.]

ERYTHROCICHLA BICOLOR (Less).

a—b. 2 Males. Gurun, Kedah, 50 ft. 13th December, 1915. [Nos. 2,243-4.]

"Iris pale hazel, bill horn, blackish on culmen, feet fleshy." [H.C.R. & C.B.K.]

DRYMOCATAPHUS NIGROCAPITATUS (Eyton).

a. 1 Male. Gurun, Kedah, 50 ft. 12th December, 1915. [No. 2,234.]

"Iris red, upper mandible black, lower greenish white, feet pale brown." [H.C.R. & C.B.K.]

SETARIA AFFINIS (Blyth).

a. 1 Female. Gurun, Kedah, 50 ft. 12th December, 1915. [No. 2,230.]

"Iris hazel, bill slate, lower mandible greenish slate, feet pale slate." [H.C.R. & C.B.K.]

ANUROPSIS MALACCENSIS, Hartl.

a. 1 Female. Gurun, Kedah, 50 ft. 11th December, 1915. [No. 2,222.]

STACHYRIS NIGRICOLLIS (Temm).

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915. [No. 2,246.]

"Iris red, bill black, base slate, feet black." [H.C.R. & C.B.K.]

MACRONUS PTILOSUS, Jard. and Selby.

a. 1 Male. Gurun, Kedah, 50 ft. 13th December, 1915. [No. 2,245.]

"Iris red, orbital skin smalt, bill black, feet greenish black." [H.C.R. & C.B.K.]

PLATYSMURUS LEUCOPTERUS (Temm).

a—b. 2 Males. Gurun, Kedah, 50 ft. 12th December, 1915. [Nos. 2,226, 2,231.]

"Iris carmine, bill and feet black." [H.C.R. & C.B.K.]

DICRURUS ANNECTENS, Hodgs.

a—c. 3 Females imm. Gurun, Kedah, 50 ft. 12–13th December, 1915. [Nos. 2,225, 2,236, 2,255.]

"Iris red, or reddish brown, bill and feet black." [H.C.R. & C.B.K.]

DICRURUS NIGRESCENS, Oates.

Dicrurus nigrescens, Oates, *Fawn. Brit. Ind. Birds*, i, p. 315 (1889).

a—e. 2 Male, 3 Female. Near Alor Star, Kedah. 25th November, 1915. Nos. 2,260–4.

"Iris red, bill and feet black." [H.C.R. & C.B.K.]

This locality is the most southerly recorded for the Tenasserim Ashy Drongo. The species is new to the Federated Malay States Museums.

EULABES JAVANENSIS (Osbeck).

a. 1 Male. Gurun, Kedah, 50 ft. 12th December, 1915. [No. 2,139.]

"Iris hazel, bill orange, tip and lappets chrome, legs chrome, claws, dark horn." [H.C.R. & C.B.K.]

LEPTOCOMA HASSELTII (Temm).

a. 1 Male. Gurun, Kedah, 50 ft. 12th December, 1915. [No. 2,235.]

"Iris dark, bill and feet black." [H.C.R. & C.B.K.]

REPTILES & BATRACHIANS.

1. GONYOCEPHALUS GRANDIS (Gray).

Blgr. p. 66.

A half-grown example was obtained at Gurun.

2. CALOTES CRISTATELLUS (Kuhl.).

Blgr. p. 70.

One example of the green "chameleon," so common in the more southern parts of the Peninsula, was obtained at Gurun, where it was apparently largely replaced by the following species.

3. CALOTES VERSICOLOR (Daud).

Blgr. p. 71.

Very numerous in the scrub vegetation about Gurun, and very sluggish, being easily taken by hand while seated on the branches and twigs of bushes, though it attempted to bite vigorously when caught.

4. MABUIA MULTIFASCIATA (Kuhl.).

Blgr. p. 84.

1 juv.

5. OXYGLOSSUS LAEVIS, Gunth.

Blgr. p. 225.

A small specimen of this frog was obtained at Gurun. It does not appear to have been met with often in the Peninsula.

Snout to vent 18 mm.

6. RANA MACRODON, Dum and Bibr.

One example from Gurun measuring 110 mm. from snout to vent.

7. RANA LIMNOCHARIS, Wieg.

Blgr. p. 236.

Numerous specimens were obtained at Gurun, the largest measuring 55 mm. from snout to vent; with two exceptions all possess a yellow vertebral stripe varying from 4 mm. to a hair's breadth.

8. RHACOPHORUS LEUCOMYSTAX, Gravenh.

2 examples from Gurun,

9. BUFO ASPER, Gravenh.

A small example of a toad from Gurun, measuring 27 mm. from snout to vent, appears to be the young of this species: there are, however, no bony ridges on the head nor in any tympanum distinguishable.

10. BUFO MELANOSTICUS, Schneid.

Blgr. p. 273.

A medium-sized individual from Gurun, with abnormal coloration, being blackish-brown above with this colour extending over and covering much of the undersurface in the form of patches and spots.

11. BUFO PARVUS, Blgr.

Blgr. p. 274.

One example from Gurun, snout to vent 28 mm. There are a number of distinct dark patches and irregular stripes on the upper surface, sides and limbs.

XVI. NOTES ON THE *HYPOMELANUS* FRUIT-
BATS OF THE STRAITS OF MALACCA, WITH THE
DESCRIPTION OF A NEW RACE *PTEROPUS*
HYPOMELANUS FRETENSIS.

By C. BODEN KLOSS, F.Z.S.

During the course of a cruise in the Straits of Malacca in April, 1915, the small islands of Paya and Jarak were visited and from each examples of the *hypomelanus* species of Flying-fox were obtained. This species has been represented hitherto along the west side of the Malay Peninsula by *P. h. geminorum* from the Mergui Archipelago and by *P. h. robinsoni* from the Sembilan Islands, about 10 miles from land, off the mouth of the Perak River.

P. h. geminorum, Miller, has until now been known only from the type locality, South Twin Island, in the Mergui Archipelago, so that its occurrence on Pulau Paya, about 350 miles to the south, considerably extends its range which, when more of the small intermediate islands have been examined, will doubtless be found continuous between the two.

Pulau Paya is roughly 7 miles west of the mouth of Kedah River and about the same distance south-east of the Langkawi group. It is a wooded island about a mile in length and half in breadth standing just within the 15 fathom line of soundings. Three examples of *P. h. geminorum*, which has now to be added to the faunal list of the Malay Peninsula, were obtained upon it, a male and two females, having the following external appearance:—

Backs: blackish-brown freely sprinkled with silvery hairs, producing a markedly grizzled effect.

Heads: like backs, the palest-backed specimen (female) having the greyest head; that of the male tinged with brown.

Mantles: male; hazel, narrowly edged posteriorly with bay; females, 1, bay, and 2, blackish-bay.

Underparts; throats blackish (except in the pale-backed female where it is grey like the head), chests seal-brown, rest of the lower surface strongly grizzled aniline black.

(For measurements see table p. 248.)

P. h. robinsoni, K. And., was described from three specimens collected on Pulau Rumpia: as we have now obtained others from that island, and also two more examples from Pulau Lallang, another of the Sembilan group, it is possible to give further particulars about this race.

Males, 4 examples:—

Backs: all specimens; brownish-black, sprinkled with silvery whitish hairs.

- 10/15. Mantle; ochraceous-tawny, becoming bay at the edges.

Head; black, rather more frosted than the back.

Underparts: brownish-black to black, scanty grizzled with pale hair tips.

- 9/15. Mantle; russet with darker edges.

Head; Mars-brown tinged with black.

Underparts; cheeks and throat blackish, chest bay, abdomen from ochraceous-tawny in centre to black on sides.

- 84/15. Mantle; warm blackish-brown, chestnut posteriorly.

Head; dark Mars-brown.

Underparts; as 9/15 but darker throughout.

- 85/15. Mantle; ochraceous-orange washed with chestnut on nape and shoulders.

Head and Underparts as 9/15.

Females 4 examples:—

Backs; light seal-brown sprinkled with a few whitish hairs (one individual, 8/15, is much paler than the others approaching in colour examples of *P. h. lepidus*, Miller, from the east side of the Peninsula).

248/09. Mantle, Sanford's brown, paler on posterior edge.

Three other females:—Mantles as above but much paler throughout.

Heads; pale Mars-brown, but this colour extending only to the cheeks and just beyond the eyes, crown like the posterior part of mantle or paler.

Underparts; centres of abdomen pale ochraceous-tawny, becoming seal-brown on throat and sides; no black.

An immature male resembles the females.

(For measurements see table p. 248).

While visiting Pulau Jarak seven specimens of a *hypomelanus* bat were collected. This little islet, which lies towards the middle of the Straits of Malacca about 30 miles west of the Sembilan Islands, is about 500 ft. high, in greater diameter about half a mile and is covered with forest. As is the case of Pulau Paya and the Sembilans the only other mammal met with on it was a form of *Epimys rattus*.

A series of seven bats was obtained, having the following characters:—

1 Male:—

Back; like *P. h. robinsoni*.

Mantle; burnt-sienna paling posteriorly, but becoming dark bay where it meets the back.

Head; dark Mars-brown to nape.

Underparts; Mars-brown, becoming blackish on throat and sides of body.

6 Females:—

Backs; as in females of *P. h. robinsoni*.

Mantle; bay to chestnut, much darker than *P. h. robinsoni* (one example, 83/15, however closely resembling 248/09 of that race).

Heads; resembling the male (except in 83/15, where the crown and mantle are concolorous, but differing from 248/09 in which the crown is pale).

Underparts; dark like the male or with the centre of the abdomen paler (the underpart of 83/15 however almost concolorous with the mantle).

(For measurements see table p. 248).

Amongst the above animals certain sexual differences of colour seem to be observable.

In *P. h. geminorum*, the series is too small for deductions and the male is only distinguished by a paler, brighter mantle as is usual among the Fruit-bats.

In animals from the Sembilans and Jarak the back of the males are uniformly darker, being blacker (less brown) and in the Sembilan examples the heads and mantles are also darker: an immature male alone resembling the females. In the Jarak series the mantle of the single male is, on the contrary, brighter and lighter than that of the female: so that the only constant difference between the sexes of animals from those two places is in the colour of the back.

The males from the three localities much more nearly resemble each other than do the females, in whom characters seem more stable. *P. h. geminorum*, with its grey head and back, is very unlike the others, and, since their darker head, mantle and underparts clearly distinguish Jarak females from females of *P. h. robinsoni*, I propose that the former should be known as

PTEROPUS HYPOMELANUS FRETENSIS, subsp. nov.

Characterised as follows: Back, light seal-brown, sprinkled with a few whitish hairs; mantle dark bay, head dark Mars-brown to nape; underparts bright Mars-brown, becoming blackish on throat and side.

Type. Adult female (skin and skull) F.M.S. No. 80/15. Collected on Pulau Jarak, Straits of Malacca, on April 5th, 1915.

(For measurements see table p. 248).

There are no characters in the skulls and teeth which will serve to distinguish between these races and, as may be seen from the table, measurements completely intergrade.

	<i>P. h. geminorum</i> , Pulau Paya.			<i>P. h. robinsoni</i> , Sembilan Ids.			<i>P. h. fretensis</i> , Pulau Jarak.		
	Male 24/15.	Female 23/15.	Female 22/15.	Male 9/15.	Female 8/15.	Female 7/15.	Male 77/15.	Female 79/15.	Female 80/15.
Skull, total length to gnathion ...	65.6	64	62.6	65.7	64.7	63.1	67.8	63.3	62.5
" palation to incisive foramina ...	33.8	32.2	30.8	32.4	32	31.2	33	32.1	31.3
" front of orbit to tip of nasals ...	22.6	22.1	20.3	20.8	21.8	20.6	22.7	20.3	20.2
" width of brain case at zygomatica ...	23	22.4	2	23.6	22.5	21.5	23	20.5	22.6
" zygomatic width ...	36	33	32.2	38.3	34.4	31.6	37.2	31.7	34
" width across m ¹ externally ...	16.8	16.8	17.1	18.4	17.6	17.2	17.4	17	17.9
" lachrymal width ...	14	13	13	14	13.7	13.1	14.5	13.4	13.9
" width across canines externally ...	12.2	11.1	11.1	12.8	11.7	10.7	12.2	11.7	11.9
" postorbital constriction ...	7	6.9	7.3	7.6	7.1	6.5	7.2	7.2	7
" interorbital constriction ...	9.6	8.8	8	9.7	9	8.2	9.3	8.1	8.5
" width of mesopterygoid fossa ...	7.2	7.5	7.6	8.4	7.2	7.2	7.7	7.3	7.9
" width between p ⁴ -p ⁴ internally ...	10.6	10.1	10	11.2	10.5	10.2	11.2	10	10.8
" between cingula of canines ...	7.2	6.4	6.7	7.9	7	6.7	7.9	6.9	7.8
" orbital diameter ...	12.4	13.1	12.6	13.6	13	12.5	13.1	12.6	12.9
Mandible, length ...	52.3	50	48.8	51.8	49.2	49.2	53.3	49.2	49.3
" coronoid height ...	25	23.8	23	25	24	23.3	26	24	23.3
Upper teeth, c-m ² ...	25.8	24	23	24.9	24.6	23	24.8	23	22.3
Lower teeth, c-m ³ ...	29.5	27.3	27	28.3	27.7	26.5	29	26.2	25.6
Head and Body* ...	236	222	221	229	214	225	220	205	199
Forearm* ...	127	...	130	138	130	127	138	...	130
Ear* ...	22	23	24	25	24	24	...	28	25

* Native collectors' measurements.

XVII. ON TWO RODENTS NEW TO THE FAUNA
OF THE MALAY PENINSULA, WITH THE
DESCRIPTION OF A NEW SUB-SPECIES,
PITHECHEIRUS MELANURUS PARVUS

By C. BODEN KLOSS, F.Z.S.

In August 1915 I spent a fortnight on Bukit Kutu, Selangor, 3,485 ft., for the purpose of collecting insects. A few vertebrates were also obtained and preserved and amongst them were two mammals which have not hitherto been recorded from the Malay Peninsula: one being a species of small flying squirrel known hitherto from Billiton Island only and the other a form of the "red bush rat" only known until now from Java and Sumatra.

PITHECHEIRUS.

This genus has hitherto been represented by a single species, *Pithecheirus melanurus* Cuv., occurring in Java and, it is supposed, in Sumatra also, though no critical comparison between the animals of these two islands has been made.

It is a genus remarkable among the rodents of the Malayan sub-region for its long soft pelage which extends for some distance along the base of the tail, the remainder of that organ being practically hairless; and for the peculiar molar teeth. A full account, with illustrations, of *P. melanurus* is given by Dr. Jentink in "Notes from the Leyden Museum," Vol. xii (1890), p. 222; pl. 9, figs 1-4, and vol. xiv (1892), p. 122; pl. 3/4, figs 5-8.

In colour the Selangor animal apparently differs from Javanese specimens which are "chestnut tinged with red"; for the whole of the upper pelage, long, dense and very soft, is tawny throughout, but less rich in tone on the sides of the head and body and on the limbs. This colour occupies the tips of the hairs only, the whole of the bases and median portions being slate-coloured. There are a great many longer hairs which project beyond the denser fur but they are of the same colour and equally as soft as the latter.

The undersurface is clear white throughout with the exception of the fur on the base of the tail which is similar to that of the upper parts; and the chin, sides of the abdomen and lower parts of the hind-legs which are suffused with warm buff.

The ears are whitish at the base with pale brown tips and are clad with short tawny hairs on both sides. The feet are

white. The tail, which has 12 rings to the centimetre at its middle, is dark brown throughout and practically naked save for about 18 millimetres at the base, the hairs on the remainder being invisible except through a glass.

The skull, though smaller, is of the same general form as that of *P. melanurus* with the same extremely large, dilated, kidney-shaped bullae but otherwise differs in the following respects:—almost complete absence of parietal ridges with entire lack of a marked angular projection at their commencement; interparietal broader; interpterygoid space parallel-sided, not lyrate or horse-shoe shaped.

The teeth are apparently similar: of the upper molars the first has three longitudinal rows of triple cusps; the middle molar has two central, three internal and a single external cusp in contact with the first of the former (in both these teeth the median longitudinal cusps are largest); and the somewhat complicated posterior tooth has a single cusp at the anterior outer angle, two on the curved inner side and one posteriorly.

Of the lower molars the first has a small anterior cusp followed by three transverse rows of two cusps, those of the first row being as small as the front one; the middle tooth is of *Epimys* type with two transverse rows of two cusps; situated mesially at the posterior edge of both these teeth is another and much smaller cusp; the last molar has two small cusps anteriorly followed by a broad transverse ridge.

There is a marked difference in size between the teeth of Javan and Malay animals, and as the dimensions of the molars are not prone to increase with age it is apparent that the latter is a considerably smaller animal.

Though the Selangor specimen has the basi-occipital suture still open and the teeth scarcely showing signs of wear, the cranium, while globose, is somewhat rugose and I think the individual is sufficiently mature to illustrate the characters of the Peninsular animal: therefore in view of the difference of colour, size and skull characters I feel justified in separating Malayan animals from those of Java under the name of

PITHECHEIRUS MELANURUS PARVUS, subsp. nov.,
with characters as above.

Dimensions:—collectors' external measurements:—head and body, 122 (209)*; tail, 140 (186); hindfoot without claws, 26 (with claws, 30); ear, 15 (15). Skull: greatest length, 34.7 (41); condylo-basilar length, 30; palatilar length, 15.7; diastema, 8.7 (11); upper molar row, 7.3 (9); length of palatal foramina, 6; greatest length of bulla, 8.8; median nasal length 7.5; zygomatic breadth, 17.4 (22).

* Measurements in parentheses those of a Javanese example of *P. melanurus*, (Jentink *op. cit. supra*, p. 227).

Type:—Sub-adult male (skin and skull), F.M.S. Mus. No. 479/15. Collected on Bukit Kutu, Selangor, 3,400 ft., on 22nd August, 1915, by C. Boden Kloss.

PETINOMYS VORDERMANNI.

Sciuropterus vordermanni, Jentink, Notes Leyden Museum, xii, p. 150, pl. vii, figs 13 and 14 (1890); Willink, *Natuurkundig Tijdschrift Nederlandsch-Indië*, LXV, p. 233; Lyon, Proc. U. S. National Museum xxxi, p. 593 (1906).

P. vordermanni, which was described from a single specimen obtained from Billiton Island by Dr. A. Vordermann belongs to a genus characterised by a fairly short rostrum and very large, but low and flattened, bullae.

The following is the description of the type specimen, an adult male in (spirit):—

“Hairs of back black, each hair with a terminal chestnut band; sides of parachute bordered with pure white; under surface of body and of parachute pure white, cheeks and sides of neck with a brownish orange tinge. Hairs of tail of a fine chestnut, lighter towards the base of the tail. Generally the hairs are very soft and rather long.

The tail is partially distichous, namely, only its under side is distichous. All the hairs of the tail from its root to its tip are exactly of the same length.

No cheekbristles, nor bristles at the base of ears. Whiskers black.”

Young animals of the *Sciuropterus* group are generally blacker and duller above than adults and the Selangor example differs from the type in having the hairs of the upper surface tipped with ochraceous-tawny rather than chestnut, while the pelage adjacent to the edges of the membranes is clear black for 3 or 4 millimetres and in the same areas on the underside the base of the hairs are blackish with the terminal portions buffy white. The hairs of the tail are, again, vinaceous buff at the base, where they are a little shorter than on the distal portion, rapidly darkening to clove-brown: the tip is rounded; as in the type the tail is almost bushy above. In other respects the colour of the two animals appears to be similar.

The immaturity of the specimen is shown by the teeth, of which pm^3 and the last molar, though up, are not extruded but the unduly long ear and short nasals possibly indicate that when better material is available we may be able to distinguish a Malay Peninsula form. The nasals somewhat resemble those of *P. setosus*, as figured by Jentink (*loc. cit.*, figs 5-6), but in all other respects the skull eminently resembles his illustration of *P. vordermanni*.

That the dimensions of the three examples may be compared with each other they are all given here.

	Billiton.		Selangor.
	Male adult, type.	Female adult.	Female imm.
Head and body	... 100	103	96
Tail	... 110	100	96
Hindfoot	... 21	22 (with claws)	23
Ear	... 12.5	12	16
Skull: greatest length	27	29	28.8
Condyllo-basilar length	...	...	24.3
Diastema	... 5.5	5.6	5.6
Upper molar row	... 5.5	5.5	5.5
Medium length of nasals	...	8.0	6.2
Greatest breadth of skull	17.0	17.3	16.8

XVIII. NOTES ON SOME ROCK-SPECIMENS FROM THE AROA ISLANDS.

(Plates XXXV—XXXVIII).

By J. B. SCRIVENOR, *Geologist, F.M.S.*

[In August and November, 1906, the Aroa Islands were visited by Mr. H. C. Robinson and an account of the group and of the collections obtained on Pulau Jemor, the largest islet, was published by him in the Journal Federated Malay States Museums II, pp. 8-16 (1906).

A request having been made to the Museums Department for information as to the geology of the Aroas a third visit was paid to them in February, 1915, to collect rock specimens and to obtain a series of the native rat (*E. rattus* subsp.) of which animal insufficient examples had been secured on the former visits.

It is unnecessary to repeat the description of the islands already given: here it may be added, however, that they are situated near the northern extremity of a 10 fathom area projecting from the Sumatran Coast in long. $100^{\circ} 33'$ E. and Lat. $2^{\circ} 53'$ N. where they form a compact little group with a number of isolated rocks and islets occurring in the sector N.E.—S.E. of it, at distances varying from $3\frac{1}{2}$ to 7 miles. The main group is fringed by numbers of jagged rocky reefs, many of which are exposed at low spring tides (Pl. XXXV., fig. 1).

Contrasted with the numerous forested islets of this region the Aroas are somewhat remarkable on account of their lack of vegetation, a scarcity which is most pronounced on Pulau Jemor, the north-easternmost and largest of the central islands. On account of their open nature charming views are obtained from the summits of most of them and the exposed reddish earth and rocks add richness to the colour of the scene. Amongst the shrubs in flower in February was the pretty pale pink myrtle, *Cynomyrtus tomentosa*.

The rat is the only terrestrial mammal and no bats were seen. No birds besides the common sea or shore species (and the few others which always occur in such situations) except a pitta (*P. cyanoptera*) and rail (*A. phaenicura*) were observed, the collection made being practically similar to that secured on the former visit in August, thus showing that the migration season which was at its height in November 1906 had come to an end. A day-flying mosquito was both numerous and active.

Weathering appears to have taken place most strongly on Jemor, where vegetation is scantiest. The rocks seem to be tilted at a high angle, about 70 or 80 degrees, and to dip from

S. W. to N. E. The sandstone is of varying stages of hardness and at the summit of the island is soft and crumbly (pl. XXXVI., fig. 2). Where it has weathered it is cut down to about sea-level and what were once larger islands now consist of a group of several smaller ones connected by a sandy gully or standing on a common reef awash at low tides. There appears to be no coral in the vicinity. *C. Boden Kloss.*]

SEDIMENTARY ROCKS FROM PULAU JEMOR,
OR LONG AROA.

Specimens of sandstone and shale from Pulau Jemor were sent to me in February, 1915 by Mr. H. C. Robinson. They are grey shale, light coloured sandstone, and a slightly coarser sandstone, partly stained red, and containing small white angular fragments which suggest kaolinized feldspar, but which are in reality derived from a weathered rock containing micro-organisms.

The shale contains minute flakes of mica and resembles the grey shales found in several localities of the Peninsula. The specimens do not show any organisms.

Thin sections mounted for examination with the microscope are necessary to see the micro-organisms in the white angular fragments of the sandstone. As the sections are not very translucent, bright illumination is necessary, and then only a few fragments show the organisms clearly. They are all radiolaria, sometimes showing the reticulation of the test plainly but never sufficiently well preserved for specific determination.

Fragments and pebbles of a similar radiolarian rock are common in the coarse quartzites of the Peninsula, where they have been almost certainly derived from certain radiolarian cherts found *in situ*. The quartzites, as far as is known at present, are all Mesozoic, fossils having been found in Perak, Pahang and Singapore, and the fragments in the Aroa rocks suggest that they may be an extension of the Peninsula rocks. If opportunity offers, the grey shales should be searched for *Estheriella*, a small fossil difficult to detect, that occurs in Perak and points to brackish or fresh water conditions during the Trias, when the shales were laid down.

Mr. Robinson describes the rocks on Pulau Jemor as highly inclined. One of the photographs (Pl. XXXVI, fig. 1) shows this.



C. B. Kloss, Photo.

FIG. 1.

LOW WATER AT WEST BAY, PULAU JEMOR, AROA ISLANDS,
STRAITS OF MALACCA.



C. B. Kloss, Photo.

FIG. 2.

LOW LAND ACROSS THE MIDDLE OF PULAU JEMOR.



C. B. Kloss, Photo.

FIG. 1.

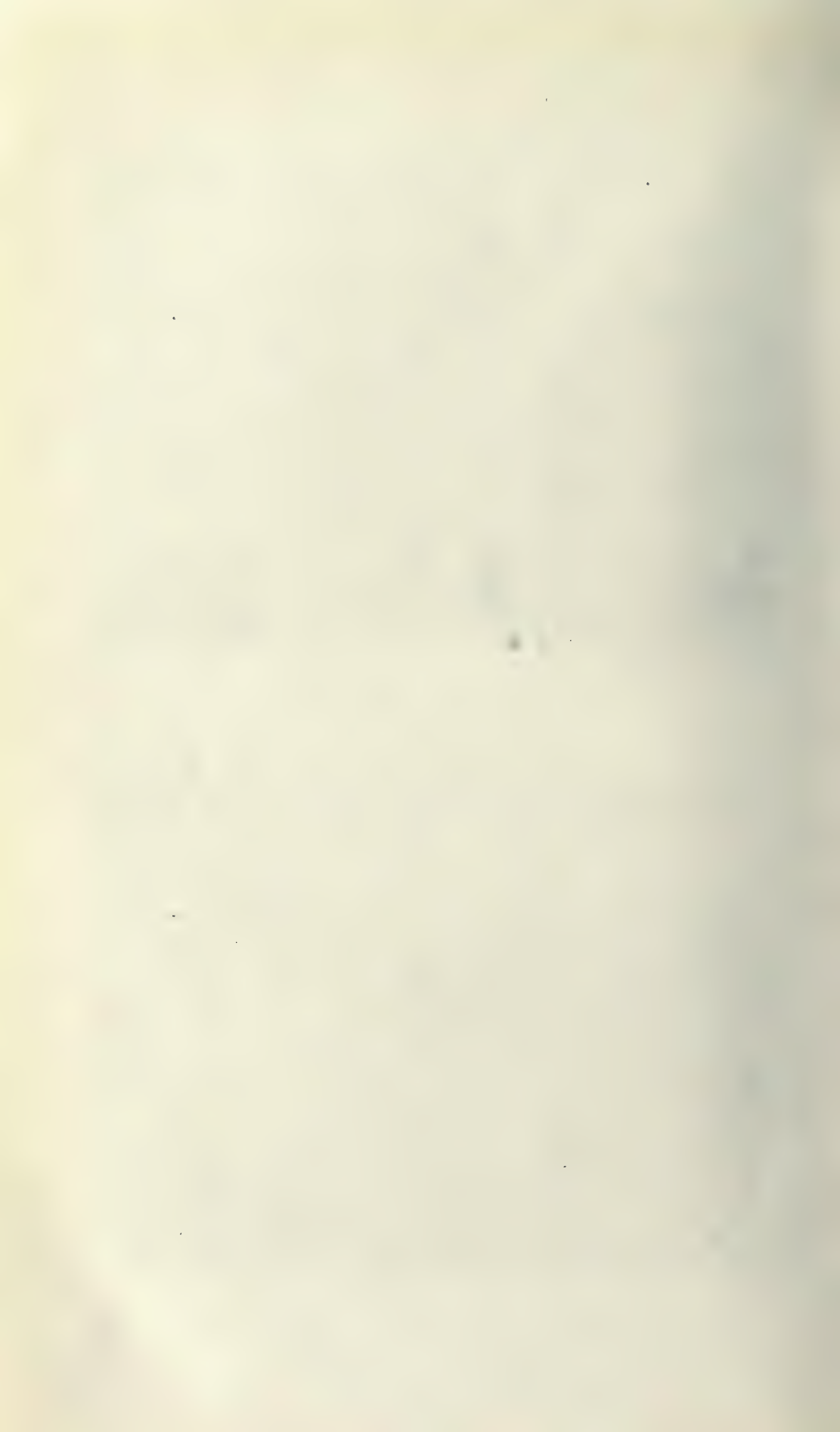
SOUTH-EAST COAST OF PULAU JEMOR, AROA ISLANDS.



C. B. Kloss, Photo.

FIG. 2.

SUMMIT OF THE SOUTH-WEST EXTREMITY OF PULAU JEMOR.





C. B. Kloss, Photo.

FIG. 1.

PULAU JEMOR FROM THE WESTERN GROUP, AROA ISLANDS.



C. B. Kloss, Photo.

FIG. 2.

WESTERN GROUP, AROA ISLANDS, FROM PULAU JEMOR.



C. B. Kloss, Photo.

FIG. 1.

BAY IN THE MAIN ISLAND, WESTERN GROUP, AROA ISLANDS.



C. B. Kloss, Photo.

FIG. 2.

SOME SMALLER ISLANDS OF THE WESTERN GROUP, AROA ISLANDS.

XIX. ADDITIONS TO RIDLEY'S "LIST OF
THE FERNS OF THE MALAY PENINSULA."

By C. G. MATTHEW, *Fleet-Surgeon*.

Mr. Ridley's List of the Ferns of the Malay Peninsula was published in 1908 on pp. 1-50 of the fiftieth part of the Journal of the Straits Branch of the Royal Asiatic Society. To it the following are addenda, arranged with references to the pages of the List:—

- p. 7. *Gleichenia flagillaris*, Spr. Singapore, Johore (Matthew).
8. *Alsophila Ridleyi*, Baker. Penang Hill (Matthew).
9. *A. Kingii*, C.B. Clarke. Perak: Gunong Inas, 5,600 ft. (R. H. Yapp); Gunong Hijau, 4,500 ft. (Matthew).
A. dubia. Bedd. Gunong Inas (R. H. Yapp.).
10. *Dicksonia* (*Dennstoedtia*) *scandens*, Bl. Perak: 4,600 ft. (Hose); Gunong Hijau, 4,000 ft. (Matthew); Gunong Bubu, 5,400 ft. (Herb. Kew).
12. *Trichomanes Mottleyi*, van den Bosch. Perak: Kunas River (Matthew).
13. *T. pyxidiferum*, Linn. Singapore (Matthew).
14. *T. Penangianum*, Christ., sp. nov. Penang Hill, (Matthew).
17. *Davallia Lorrainei*, Haner. Penang (Herb. Kew).
23. *Pteris pellucida*, Presl. Perak: Gunong Hijau (Matthew). Penang: Richmond Pool (Matthew).
Pt. inaequalis, Baker. Perak: Maxwell's Hill, 2,500 ft. (Matthew).
24. *Pt. asperula*, J. Sm. Perak: Gunong Pondok (Matthew).
Pt. longipes, Don. Perak: Maxwell's Hill, 3,000 ft. (Matthew).
27. *Asplenium Mactieri*, Bedd. = *A. Wightianum*, Wall., with simple fronds.
A. subavenium, Hook. Maxwell's Hill (Matthew).
28. *A. hirtum*, Kaulf. Maxwell's Hill (Matthew).
29. *Diplazium porphyrorachis*, Baker. Perak (Herb. Kew).
30. *D. ziphophyllum*, Baker. Perak (Hose).
D. japonicum, Christ. Perak: Maxwell's Hill (Matthew).
31. *Anisogonium heterophlebium*, Mett. Pahang: Telom River. (Ridley).

- p. 35. *Lastrea sparsa*, Don. Perak; Maxwell's Hill, (Matthew).
36. *Nephrodium extensum*, Bl. Singapore (Matthew).
37. *N. glandulosum*, Hook. Singapore (Matthew).
N. procurrens, Baker. Singapore: Bukit Timah (Matthew).
38. *N. abortivum*, J. Sm. Singapore: Bukit Timah (Matthew).
39. *Nephrolepis ramosa*, Moore. Selangor: Batu Caves (Matthew).
41. *Polypodium callophyllum*, C. H. Wright, sp. nov. Perak: Gunong Hijau (Matthew).
P. lomarioides, Bl. Singapore: Bukit Timah, on high Shoreas. This is the fern referred to in Ridley's List p. 10 as *Lecanopteris*, Bl.
42. *P. barathrophyllum*, Baker. Perak (Hose).
46. *Pleopeltis Sarawakensis*, Baker. Perak: Maxwell's Hill (Matthew). Probably the "*Pl. superficialis*, Bl."
47. *Pl. pteropus*, Bl. Selangor: Batu Caves (Matthew).
49. *Syngamme quinata*, Hook. Perak: Maxwell's Hill (Matthew).
Selliguea Hamiltoniana, Hook. Malay Peninsula (Scortechini).
51. *Antrophyllum coriaceum* (Wall.). Perak (King's collector, No. 565).
A. plantagineum var. *angustifolium* (Brack.). Malay Peninsula: Gunong Sonoy (M. de Morgan).
Vittaria Sikkimensis, Kuhn. Penang Hill (Ridley). Perak: Maxwell's Hill (Matthew).
V. Ridleyi Christ., in lit. Province Wellesley: Bukit Panchur (Ridley). Very near *V. elongata*.
55. *Photinopteris rigida*, Wall. Perak: Maxwell's Hill (Matthew).
58. *Lygodium polystachyum*, Wall. Perak: Gunong Pondok (Matthew).
59. *Alsophila glabra*, Hook. Perak: Gunong Hijau, 4,500 ft. (Matthew).

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ERRATA.

p. 48 No. 60 *for* *Laudiculatus* *read* *L. caudiculatus*.

p. 51 No. 86 *for* *Caudate* *read* *Caudata*.



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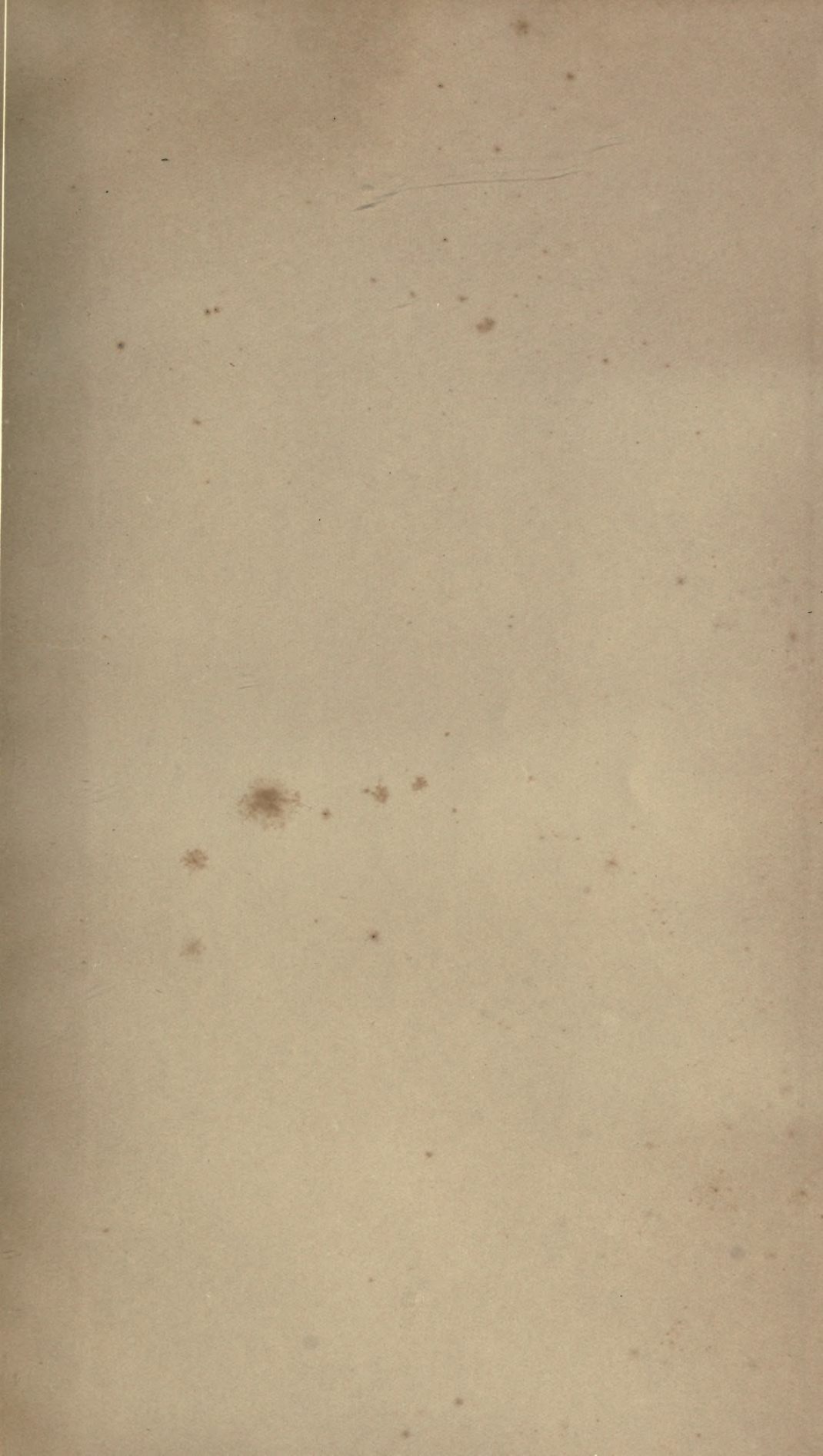
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